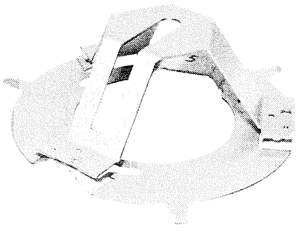
ORDER NO. AVS9204558C8

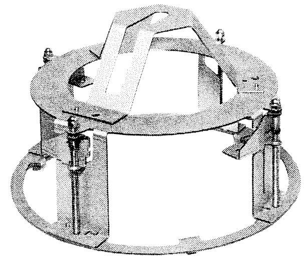
Service Manual

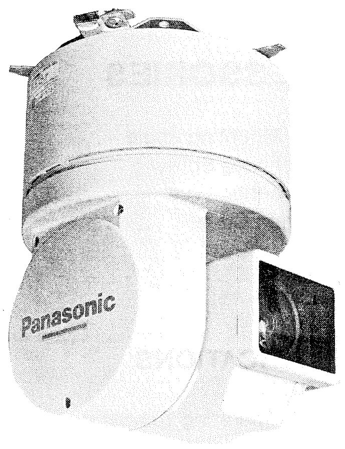
Ceiling Mount Bracket
WV-Q101

Ceiling Mount Bracket
WV-Q102

Combination Camera
WV-CS300


WV-Q101


WV-Q102


WV-CS300

SPECIFICATIONS

Power Source :	WV-CS300/A, WV-CS300/B : 240 V AC, 50 Hz WV-CS300/G : 230 V AC, 50 Hz
Power Consumption :	WV-CS300/A, WV-CS300/B : Approx. 16 W WV-CS300/G : Approx. 15 W
Ambient Operating Temperature :	−10°C - +50°C
Ambient Operating Humidity :	Less than 90%
Dimensions :	254 (H) × 185 (W) × 185 mm
Weight :	5.5 kg
Camera	
Pick-up Device :	1/2" CCD with 681 (H) × 582 (V) pixels
Horizontal Scanning Frequency :	15.625 KHz
Vertical Scanning Frequency :	50 Hz
Video Output :	1.0 Vp-p PAL Composite/75 ohms
Horizontal Resolution :	More than 430 lines at centre
Vertical Resolution :	More than 400 lines at centre
Signal-to-noise :	46 dB (AGC OFF)
Minimum Illumination :	3 Lux
Zoom Speed :	Approx. 5 sec.
Focus Speed :	Approx. 5.3 sec.
Iris :	Auto
Maximum Aperture Ratio :	1 : 1.4
Focal Length :	8 - 80 mm

Panasonic

Pan/Tilt

Panning Speed :	Approx. 11.4°/sec.
Panning Angle :	0° - 350° (maximum), Adjustable
Tilting Speed :	Approx. 5.7°/sec.
Tilting Angle :	0° - 90° (fixed)

Weight and dimensions indicated are approximate.
Specifications are subject to change without notice.

ACCESSORIES

Camera Mounting Angle	1 pc.
Camera Fixing Screw	1 pc.
Fall Prevention Wire	1 pc.
Decoration Cover	1 pc.

SPECIFICATIONS

(WV-Q101)

Ambient Operating Temperature :	−10°C - +50°C
Dimensions :	ϕ160 × 53 (D) mm
Weights :	250 g

Weights and dimensions indicated are approximate.
Specifications are subject to change without notice.

ACCESSORIES

Fall Prevention Wire	1pc.
Anchor Bolt Washer	1pc.
Angle Bolt Washer	3pcs.
Fall Prevent Angle	1pc.
Fixing Screw for Camera Fixing Angle	3pcs.
Template	1pc.

SPECIFICATIONS

(WV-Q102)

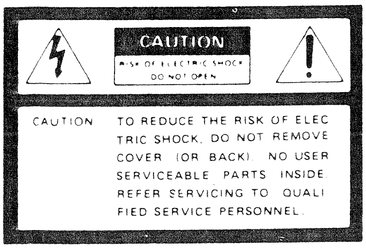
Ambient Operating Temperature :	−10°C - +50°C
Dimensions :	ϕ186 × 68 (D) mm
Weights :	1.0 kg

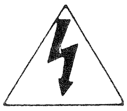
Weights and dimensions indicated are approximate.
Specifications and subject to change without notice.

ACCESSORIES

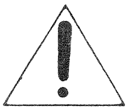
Fall Prevention Wire	1pc.
Anchor Bolt Washer	1pc.
Fall Prevent Angle	1pc.
Template A	1pc.
Template B	1pc.

THE CIRCUITRY DESIGNED FOR THIS CAMERA IS SIMILAR TO THAT OF WV-CL350.
REFER TO THE SERVICE MANUAL OF WV-CL350 FOR THE CIRCUITDESCRIPTION.


CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN
CAUTION
TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK). NO USER SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.



This symbol warns the user that uninsulated voltage within the unit may have suificient magnitude to cause electric shock. Therefore, it is dangerous to make any kind of contact with any inside part of this unit.



This symbol alerts the user that important literature concerning the operation and maintenance of this unit has been included.
Therefore, it should be read carefully in order to avoid any problems.

IMPORTANT SAFETY NOTICE

There are special components used in this equipment which are important for safety. These parts are indicated by the " ⚠ " mark on the schematic diagram and the replacement parts list. It is essential that these critical parts should be replaced with manufacturer's specified parts to prevent shock, fire, or other hazards.
Do not modify the original design without permission of manufacturer.

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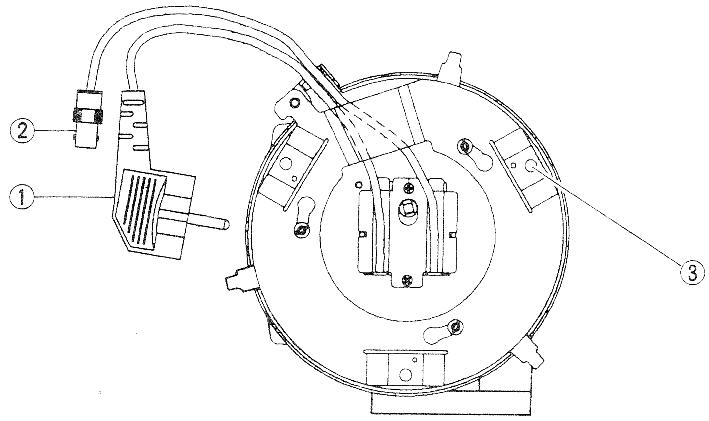
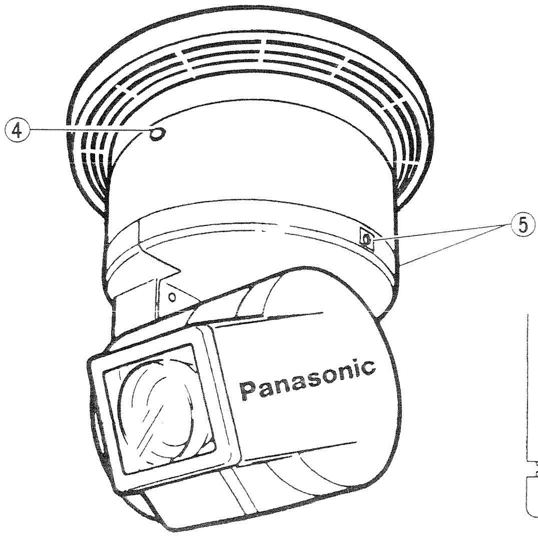
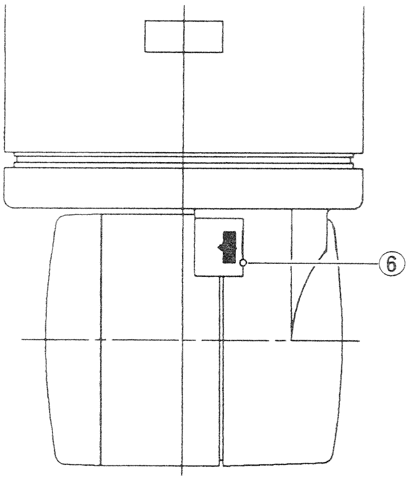
MAJOR OPERATING CONTROLS AND THEIR FUNCTIONS







1. **Power Cable**

2. **Video Output Connector**
   This cable is connected to the Remote Controller WV-CU101 or WV-CU254 directly by using the single coaxial cable.
   The maximum cable length between this unit and the Remote Controller is 1200m using 5C-2V or equivalent.

3. **Camera Fixing Angle**

4. **Power Switch**
   This is a push-push type switch.
   Press once for turning on the power of this unit.
   Press again for turning off the power of this unit.

5. **Pan Angle Limit Adjusting Screws**
   These screws are used to lock the Pan Angle Limit.

6. **Power Indicator**

Setting Condition		
Power Switch	Camera Unit	Indicator
OFF	—	Lights off
ON	Stand-by	Green
ON	ON	Red

About Your Computer

In order to run the E.V.R (Electric Variable Resistor) adjustment program your IBM-PC (PS2 type) or compatible must meet the following requirements :

- The DOS Operating System must be 3.3 or higher.
- The Operating System must be 100% compatible with your computer.
- The memory in your IBM-PC must be at least 640K-bytes, and 512K-bytes shall be available to the E.V.R adjustment program.

Installing E.V.R Adjustment Program

- The Example given here is for A 2 drive computer, your procedure might vary slightly depending on drive configuration.
- Formatting new disk and making a copy of DOS Operating System

  a) Insert disk containing DOS operating system into your floppy drive (for example, drive A) and type **A** :
  b) Insert new disk into your floppy drive (for example, drive B).
  c) Format and make a copy of DOS operating system from your original disk to new disk by typing **FORMAT B : / S** and press **ENTER.**
  d) Type **COPY ANSI. SYS B** : and press **ENTER.**

- Install E.V.R Adjustment Program onto formatted new disk with DOS operating system.

  e) Take out original disk containing DOS operating system from your floppy drive (drive A) and insert disk containing E.V.R adjustment program into your floppy drive (drive A) and type A :
  f) At the prompt, type **CD IBMPC** and press **ENTER.**
  g) If required, type **COPY CONFIG. SYS B**: and press **ENTER.**
  h) Type **CD NTSC.**
  i) Type **COPY ADJS. EXE B** : and press **ENTER.**
  j) Type **CD \ SEQ** and press **ENTER.**
  k) Type **COPY CS300E-A. SEQ B** : and press **ENTER.**
  l) Type **CD ** and press **ENTER.**
  m) Type **CD EVR** and press **ENTER.**
  n) Type **COPY CS300E-A. EVR B** : and press **ENTER.**
  o) After completing installation of program, you are ready to use E.V.R adjustment program.

Note :

When completed the new disk should be a bootable disk which contains the following files

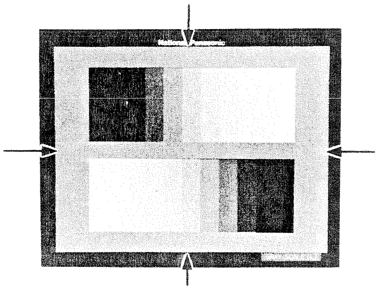
1.	COMMAND	CON
2.	ANSI	SYS
3.	CONFIG	WYW
4.	ADJS	EXE
5.	CS300E	SEQ
6.	CS300E	EVR

ADJUSTMENT PROCEDURE

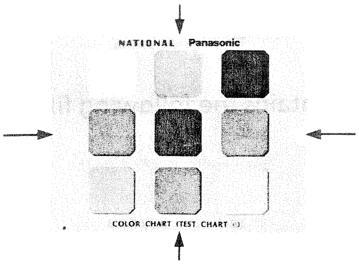
1. Test Equipment Required

The following test equipments are required for adjustment.

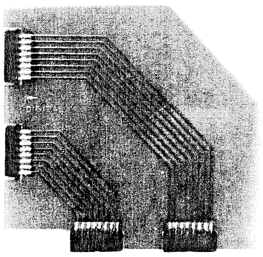
- Oscilloscope (50 MHz band width, dual trace, delayed with three probes)
- Vector scope
- Frequency counter
- Waveform monitor
- Under scanned color video monitor
- Lighting (140 footcandles (1400 lux) 3200°K)
- Lux meter
- Signal generator (Black burst or Composite video signal)
- System controller (WV-CU101 or WV-CU254)
- Personal computer (IBM-PS2 type)
- Standard straight RS-232C cable
- Logarithmic gray scale chart (Part No. : YWV2310RB99)



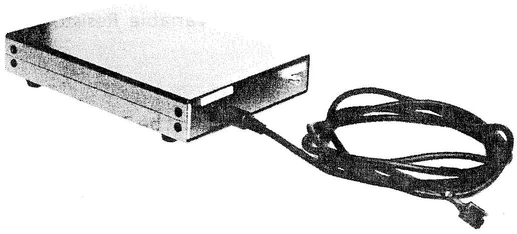
- Color chart (Part No. : YWV2310RB98)


NATIONAL Panasonic
COLOR CHART (TEST CHART)

- Extension board (Part No. : YWVKZCL32P1A)



- E.V.R Adjustment kit



2. Disassembling Procedure for Adjustment

2-1. Camera Unit

- Remove the camera front cover from the camera case.
- Remove six screws and remove the camera side covers.

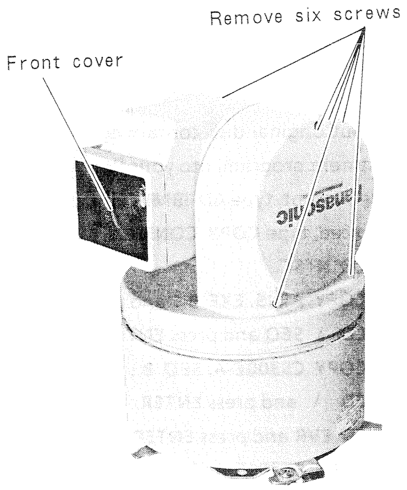

Remove six screws
Front cover

Fig. 2-1

- Remove three screws and remove the camera unit.

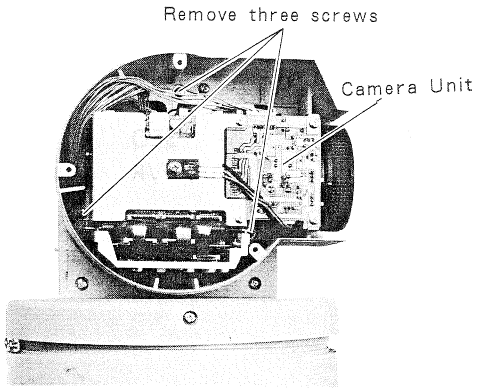

Remove three screws
Camera Unit

fig. 2-2

- Remove one screw holding the sync/Encorder board holding ungle and remove the holding ungle.

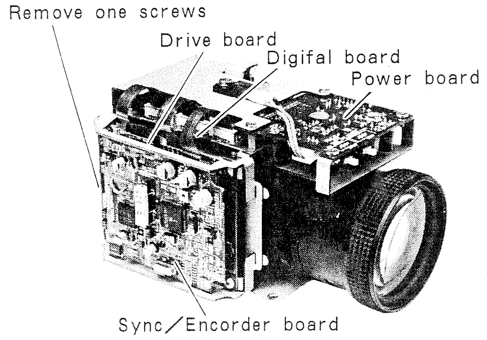

Remove one screws
Drive board
Digifal board
Power board
Sync／Encorder board

Fig. 2-3

- When adjusting the camera use extension board.

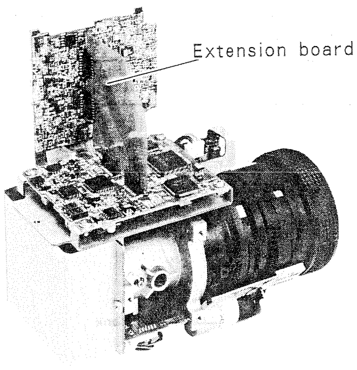

Extension board

Fig. 2-4

2-2. Pan-Tilt unit

- Remove four screws and remove the camera cover.
- Remove three screws and remove the Pan-tilt cover.

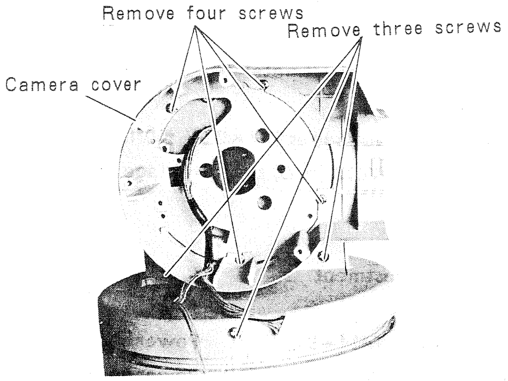

Remove four screws
Remove three screws
Camera cover

Fig. 2-5

- Remove one screw and remove the camera mounting angle.

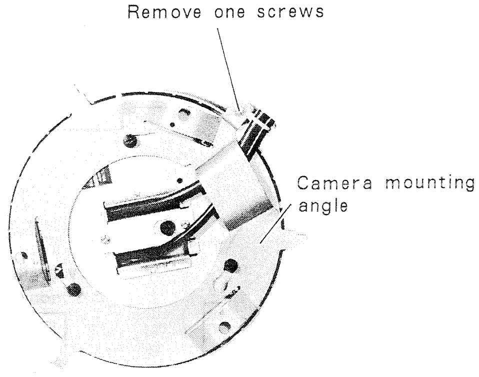

Remove one screws
Camera mounting angle

Fig. 2-6

- Remove four screws and remove bottom cover.

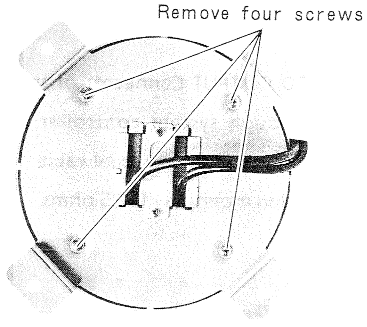

Remove four screws

Fig. 2-7

- Remove three screws and take out the Pan-tilt unit from the Pan-tilt case.

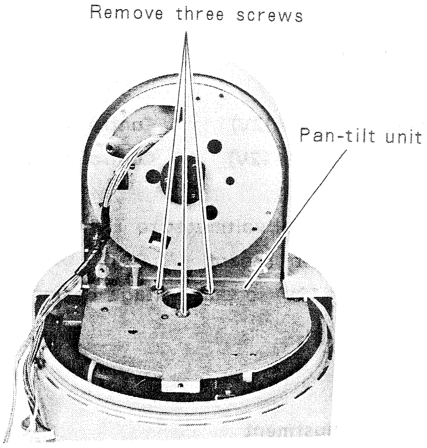

Remove three screws
Pan-tilt unit

Fig. 2-8

3. Connection and Setting up for Adjustment

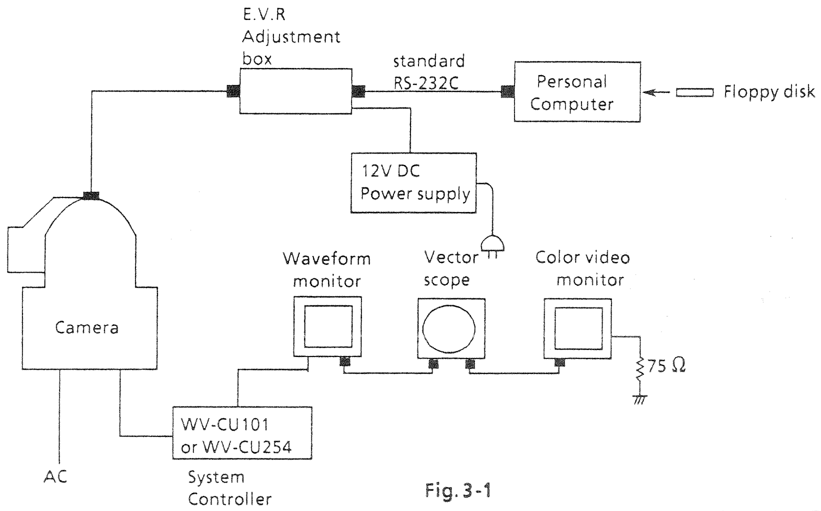

E.V.R
Adjustment
box
standard
RS-232C
Personal
Computer
Floppy disk
12V DC
Power supply
Waveform
monitor
Vector
scope
Color video
monitor
75 Ω
Camera
WV-CU101
or WV-CU254
System
Controller
AC

Fig. 3-1

- Connect the VIDEO OUTPUT Connector of the camera to video monitor through system controller, wave form monitor and vectorscope using coaxial cable.
- Terminate color video monitor with 75 ohms.

4. Adjustment Procedure

- Refer to page 19 for the Location of test point and adjusting controll.

■ Adjustment Procedure-1

(1) + 10V adjustment

Test Point :	**TP1 (+ 12V)**	**Control board**
Adjust :	**VR1 (+ 12V)**	**Control board**

- Connect the digital voltmeter to TP1 (+ 12V) and TP2 (GND) on the control board.
- Adjust VR1 (+ 12V) so that voltage becomes + 10V ± 0.05V.

(2) V.Sub Adjustment

Test Point :	**Pin 14 (OFD) of IC1**	**Sensor board**
Adjust :	**VR2 (V. SUB)**	**Sensor board**

- Check rank letter on CCD sensor assy.
- Connect digital volt meter to Pin 14 (OFD) of IC1 on Sensor board.
- Adjust VR2 (V. SUB) so that voltage becomes as shown in Table 1.

Rank	A	B	C	D	E	F	G	H	J	K
Voltage	7.0	7.5	8.0	8.5	9.0	9.5	10.0	10.5	11.0	11.5
Rank	L	M	N	P	Q	R	S	T	U	-
Voltage	12.0	12.5	13.0	13.5	14.0	14.5	15.0	15.5	16.0	-

Table-1

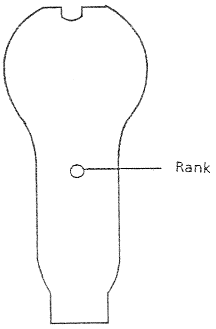


Fig. 4-1

(3) VCO Adjustment (confirmation)

Test Point :	**TP1 (VCO)**	**Drive board**
Adjust :	**VL12 (VCO)**	**Drive board**

- Connect digital voltmeter to TP1 (VCO) on the drive board.
- Confirm that voltage at TP1 is 2.3V ± 0.1V.
- If not, adjust VL12 (VCO) so that voltage becomes 2.3V ± 0.1V.

(4) + 9V Adjustment

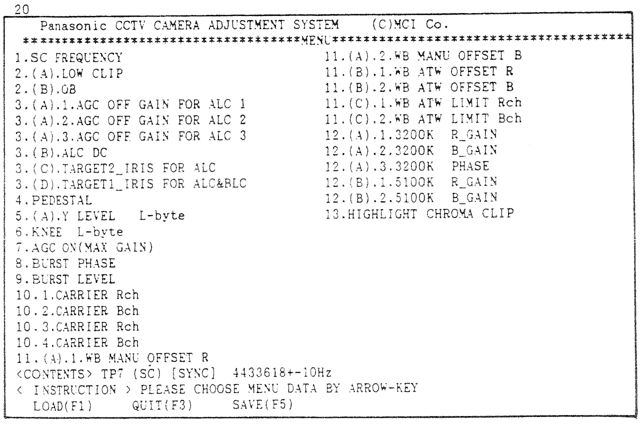
Test Point :	**TP1 (+ 9V)**	**Power board**
Adjust :	**VR1 (+ 9V)**	**Power board**

- Connect digital voltmeter to TP1 (+ 9V) on the power board.
- Adjust VR1 (+ 9V) so that voltage becomes + 9V ± 0.01V.

Adjustment Procedure-2 (E.V.R Adjustment)

- Connect E.V.R Adjustment box to CN6 on the digital board using extension cable supplied.
- Connect E.V.R Adjustment box to IBM-PC (PS2 or AT type) using standard RS-232C cable.
- Insert new disk containing Dos operating system and E.V.R Adjustment Program into IBM-PC and turns on power of IBM-PC.
- At the prompt, type **ADJS CS300E-A** and press **ENTER**, following initial menu for adjustment will be displayed.
- Press **LOAD (F1)** and type **CS300E-A, EVR,** and press **ENTER** for presetting adjustment of the camera.
- After finishing, the message **ERROR 14 SCK NG!** will be displayed, but this is normal.
- Press ENTER for starting adjustment , following adjusting screen will be displayed.

20



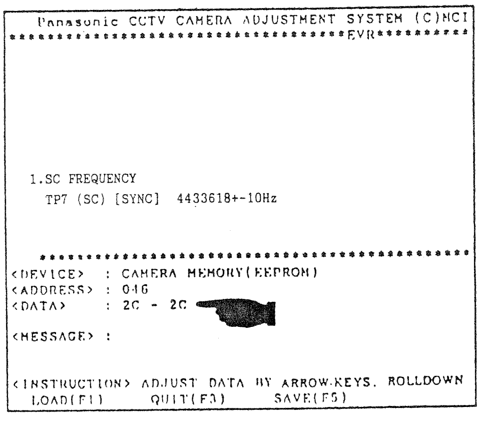
```
  Panasonic CCTV CAMERA ADJUSTMENT SYSTEM    (C)MCI Co.
*************************************MENU****************************************
1.SC FREQUENCY                            11.(A).2.WB MANU OFFSET B
2.(A).LOW CLIP                            11.(B).1.WB ATW OFFSET R
2.(B).OB                                  11.(B).2.WB ATW OFFSET B
3.(A).1.AGC OFF GAIN FOR ALC 1            11.(C).1.WB ATW LIMIT Rch
3.(A).2.AGC OFF GAIN FOR ALC 2            11.(C).2.WB ATW LIMIT Bch
3.(A).3.AGC OFF GAIN FOR ALC 3            12.(A).1.3200K  R_GAIN
3.(B).ALC DC                              12.(A).2.3200K  B_GAIN
3.(C).TARGET2_IRIS FOR ALC                12.(A).3.3200K  PHASE
3.(D).TARGET1_IRIS FOR ALC&BLC            12.(B).1.5100K  R_GAIN
4.PEDESTAL                                12.(B).2.5100K  B_GAIN
5.(A).Y LEVEL   L-byte                    13.HIGHLIGHT CHROMA CLIP
6.KNEE  L-byte
7.AGC ON(MAX GAIN)
8.BURST PHASE
9.BURST LEVEL
10.1.CARRIER Rch
10.2.CARRIER Bch
10.3.CARRIER Rch
10.4.CARRIER Bch
11.(A).1.WB MANU OFFSET R
<CONTENTS> TP7 (SC) [SYNC]  4433618+-10Hz
< INSTRUCTION > PLEASE CHOOSE MENU DATA BY ARROW-KEY
  LOAD(F1)     QUIT(F3)     SAVE(F5)
```

NOTE :

- **EEPROM** mentioned in this adjustment procedure is IC7 on digital board.
- **RAM** mentioned in this adjustment procedure is IC10 on digital board.

(1) Sub carrier frequency adjustment

Test Point : **TP7 (SC)** Sync board
Adjust : **EEPROM (46)**



```
  Panasonic CCTV CAMERA ADJUSTMENT SYSTEM (C)MCI
*****************************************EVR***********




  1.SC FREQUENCY
    TP7 (SC) [SYNC]  4433618+-10Hz


   **********************************************
<DEVICE>   : CAMERA MEMORY(EEPROM)
<ADDRESS>  : 046
<DATA>     : 2C  -  2C

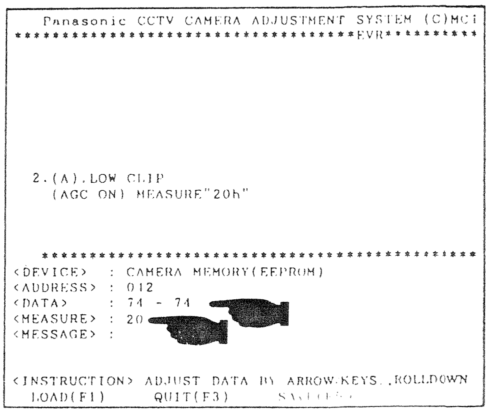
<MESSAGE>  :


<INSTRUCTION> ADJUST DATA BY ARROW-KEYS. ROLLDOWN
  LOAD(F1)      QUIT(F3)      SAVE(F5)
```

- Connect frequency counter to TP7 (SC).
- Adjust data with **ARROW** keys so that sub carrier frequency becomes 4.433618 MHz ± 10 Hz.
- Press **ENTER** key for next adjustment.

(2)-A Low clip adjustment

Test Point : **RAM (D2)**
Adjust : **EEPROM (42)**



```
  Panasonic CCTV CAMERA ADJUSTMENT SYSTEM (C)MCI
*****************************************EVR**********




  2.(A).LOW CLIP
    (AGC ON) MEASURE"20h"

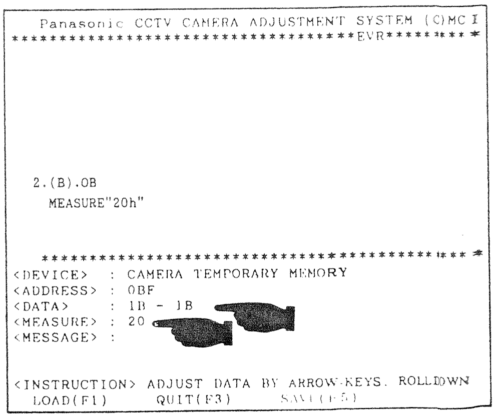

   *********************************************
<DEVICE>   : CAMERA MEMORY(EEPROM)
<ADDRESS>  : 012
<DATA>     : 74  -  74
<MEASURE>  : 20
<MESSAGE>  :


<INSTRUCTION> ADJUST DATA BY ARROW-KEYS. ROLLDOWN
  LOAD(F1)      QUIT(F3)      SAVE(F5)
```

- Cap on the lens.
- Adjust data by **ARROW** keys so that measure level becomes 20.
- Press **ENTER** key.

(2)-B OB adjustment

Test Point : **RAM (D2)**
Adjust : **EEPROM (BF)**



```
  Panasonic CCTV CAMERA ADJUSTMENT SYSTEM (C)MC I
****************************************EVR***********




  2.(B).OB
    MEASURE"20h"

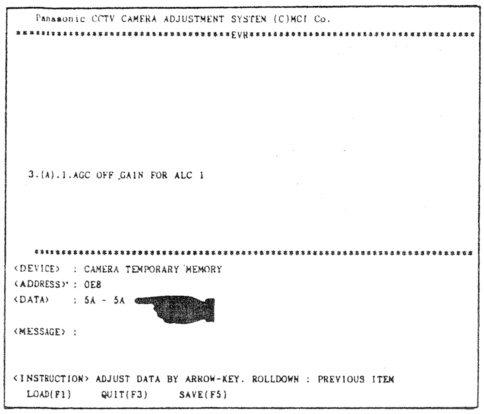

   *********************************************
<DEVICE>   : CAMERA TEMPORARY MEMORY
<ADDRESS>  : 0BF
<DATA>     : 1B  -  1B
<MEASURE>  : 20
<MESSAGE>  :


<INSTRUCTION> ADJUST DATA BY ARROW-KEYS. ROLLDOWN
  LOAD(F1)      QUIT(F3)      SAVE(F5)
```

- Cap on the Lens.
- Adjust data by **ARROW** keys so that measure level becomes 20.
- Remove adjustment (2)-A and (2)-B until both measure levels become 20.
- Press **ENTER** key.

(3)-A-1 AGC OFF gain (ALC1) adjustment

Test point : Pin1 (CDS OUT) of CNS Digital board
Adjust : RAM (E8) IC10



```
   Panasonic CCTV CAMERA ADJUSTMENT SYSTEN (C)MCI Co.
**********************************EVR*************************************




  3.(A).1.AGC OFF GAIN FOR ALC 1



   **********************************************************************
<DEVICE>   : CAMERA TEMPORARY MEMORY
<ADDRESS>  : 0E8
<DATA>     : 5A - 5A

<MESSAGE> :

<INSTRUCTION> ADJUST DATA BY ARROW-KEY. ROLLDOWN : PREVIOUS ITEM
  LOAD(F1)     QUIT(F3)     SAVE(F5)
```

- Connect oscilloscope to pin1 (CDS OUT) of CN5 on digital board.
- Aim the camera at logarithmic gray scale chart.
- Adjust data by ARROW keys so that signal level becomes 460 mV.

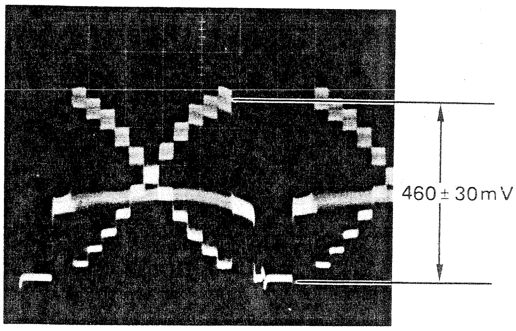
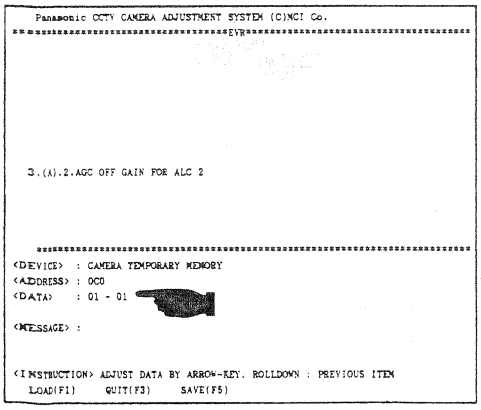


Fig. 4-2

(3)-A-2 AGC OFF gain (ALC2) adjustment

Test Point : Pin3 (AGC OUT) of CN5 Digital board
Adjust : RAM (CO) IC10



```
   Panasonic CCTV CAMERA ADJUSTMENT SYSTEM (C)MCI Co.
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  3.(A).2.AGC OFF GAIN FOR ALC 2



   **********************************************************************
<DEVICE>   : CAMERA TEMPORARY MEMORY
<ADDRESS>  : 0C0
<DATA>     : 01 - 01

<MESSAGE> :

<INSTRUCTION> ADJUST DATA BY ARROW-KEY. ROLLDOWN : PREVIOUS ITEM
  LOAD(F1)     QUIT(F3)     SAVE(F5)
```

- Change oscilloscope from pin 1 (CDS OUT) of CN5 to pin 3 (AGC OUT) of CN5.
- Mesure the voltage (V1) of Pin3 (AGC OUT) of CN5.

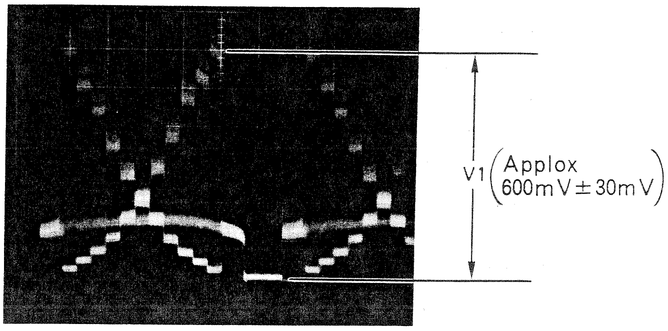
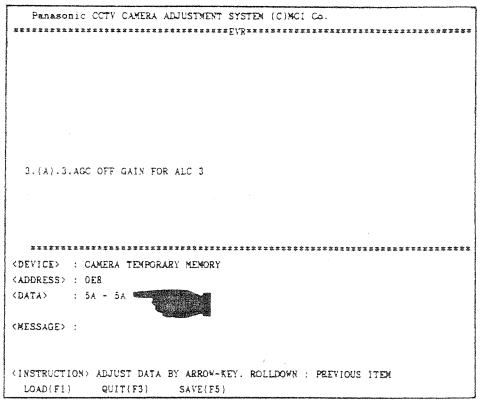


Fig. 4-3

- Adjust data by **ARROW** keys so that signal level becomes V2.
- V2 is calculated by following equation
  $$V2 = V1/600 \times 460$$
- Press **ENTER** key.

(3)-A-3 AGC OFF gain (ALC3) adjustment

Test point : Pin1(CDS OUT) of CN5 Digital board
Adjust : RAM (E8) IC10



```
   Panasonic CCTV CAMERA ADJUSTMENT SYSTEM (C)MCI Co.
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  3.(A).3.AGC OFF GAIN FOR ALC 3



   **********************************************************************
<DEVICE>   : CAMERA TEMPORARY MEMORY
<ADDRESS>  : 0E8
<DATA>     : 5A - 5A

<MESSAGE> :

<INSTRUCTION> ADJUST DATA BY ARROW-KEY. ROLLDOWN : PREVIOUS ITEM
  LOAD(F1)     QUIT(F3)     SAVE(F5)
```

- Change oscilloscope from pin3(AGC OUT) of CN5 to pin1 (CDS OUT) of CN5.
- Adjust again so that signal level becomes 460mV.

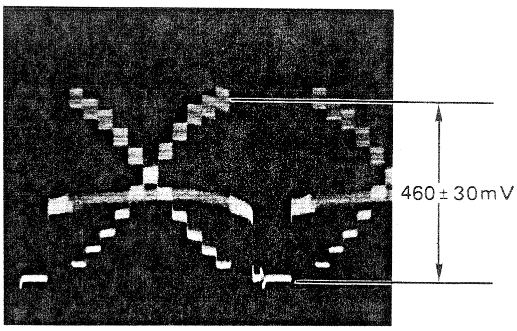
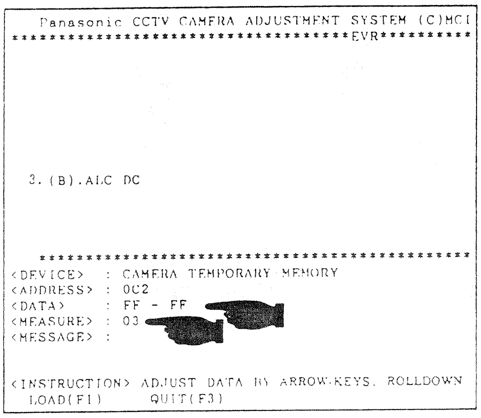


Fig. 4-4

(3)-B ALC DC adjustment

Test Point : RAM (D5)
Adjust : RAM (C2)

Note : Inatalled lens should be DC servo type for this adjustment.



```
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 3.(B).ALC DC



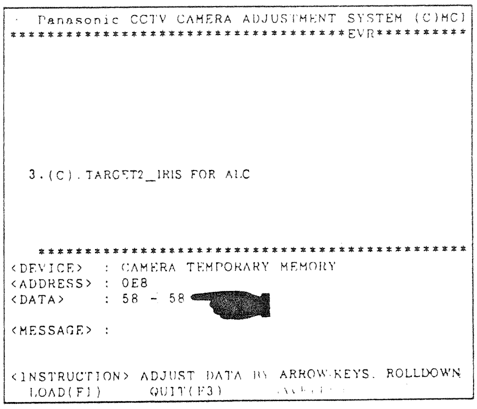
   **********************************************
<DEVICE>   : CAMERA TEMPORARY MEMORY
<ADDRESS> : 0C2
<DATA>     : FF - FF
<MEASURE> : 03
<MESSAGE> :

<INSTRUCTION> ADJUST DATA BY ARROW-KEYS. ROLLDOWN
  LOAD(F1)      QUIT(F3)
```

- Aim the camera at logarithmic gray scale chart.
- Adjust data by **ARROW** key so that measure level becomes between 03 and 04.
- Press **ENTER** key.

(3)-B BLC preset OFF (Target 2 iris) adjustment

Test Point : Pin 1 (CDS OUT) of CN5
Digital board
Adjust : RAM (E8) IC10



```
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 3.(C).TARGET2_IRIS FOR ALC



   **********************************************
<DEVICE>   : CAMERA TEMPORARY MEMORY
<ADDRESS> : 0E8
<DATA>     : 58 - 58

<MESSAGE> :

<INSTRUCTION> ADJUST DATA BY ARROW-KEYS. ROLLDOWN
  LOAD(F1)      QUIT(F3)
```

- Aim the camera at logarithmic gray scale chart.
- Connect oscilloscope to pin 1 (CDS OUT) of CN5.
- Adjust data by **ARROW** keys so that signal level becomes 460 ± 30 mV.

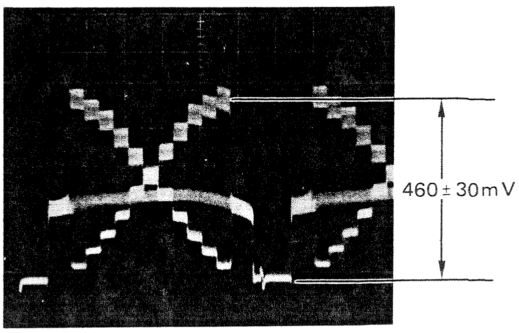
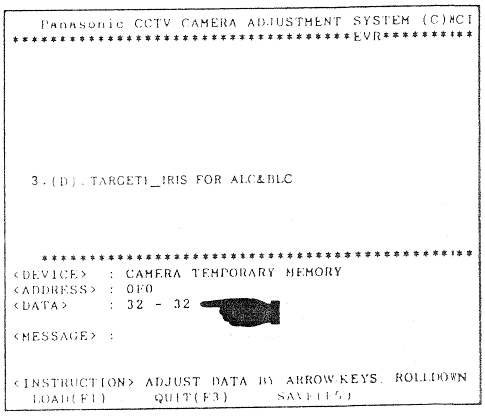


Fig. 4-5

(3)-D ALC preset ON (Target 1 iris) adjustment

Test Point : Pin 1 (CDS OUT) of CN5
Digital board
Adjust : RAM (F0) IC10



```
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 3.(D).TARGET1_IRIS FOR ALC&BLC



   **********************************************
<DEVICE>   : CAMERA TEMPORARY MEMORY
<ADDRESS> : 0F0
<DATA>     : 32 - 32

<MESSAGE> :

<INSTRUCTION> ADJUST DATA BY ARROW-KEYS. ROLLDOWN
  LOAD(F1)      QUIT(F3)      SAVE(F5)
```

- Aim the camera at logarithmic gray scale chart.
- Connect oscilloscope to pin 3 (AGC OUT) of CN5.
- Adjust data by **ARROW** keys so that signal level becomes 460 ± 30 mV.

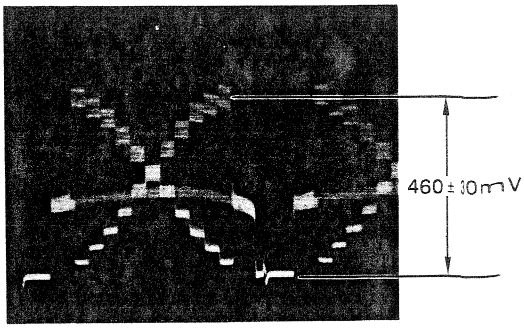
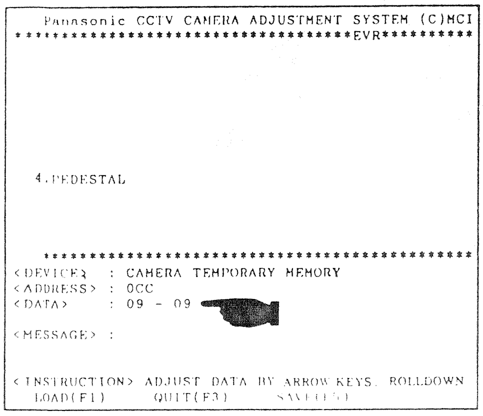


Fig. 4-6

(4) Pedestal adjustment

Test Point : **VIDEO OUTPUT connector**
Adjust : **RAM (CC)**



```
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4.PEDESTAL


*************************************************
<DEVICE>   : CAMERA TEMPORARY MEMORY
<ADDRESS>  : 0CC
<DATA>     : 09 - 09

<MESSAGE>  :

<INSTRUCTION> ADJUST DATA BY ARROW KEYS. ROLLDOWN
  LOAD(F1)       QUIT(F3)       SAVE(F5)
```

- Cap on the lens.
- Connect waveform monitor or terminated oscilloscope to VIDEO OUTPUT connector.
- Adjust data by **ARROW** keys so that signal level becomes 50 ± 5 mV.

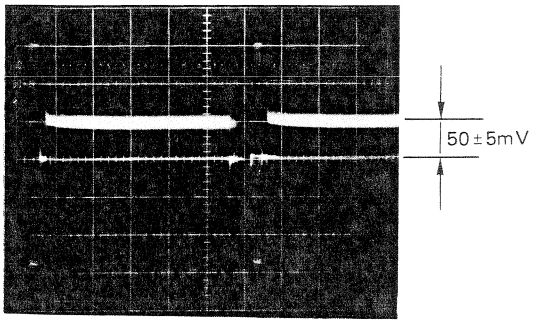
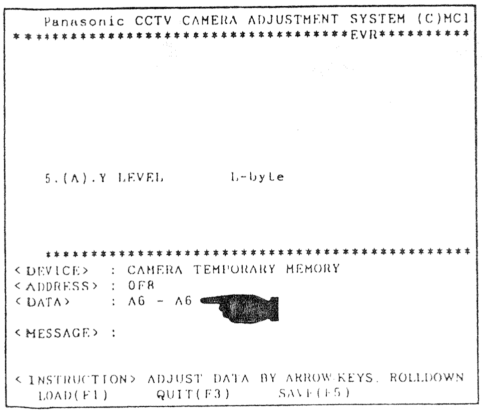


Fig. 4-7

- Press **ENTER** key.

(5)-A Y. level adjustment

Test Point : **VIDEO OUTPUT connector**
Adjust : **RAM (F8)**



```
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5.(A).Y LEVEL         L-byte


*************************************************
<DEVICE>   : CAMERA TEMPORARY MEMORY
<ADDRESS>  : 0F8
<DATA>     : A6 - A6

<MESSAGE>  :

<INSTRUCTION> ADJUST DATA BY ARROW KEYS. ROLLDOWN
  LOAD(F1)       QUIT(F3)       SAVE(F5)
```

- Aim the camera at logarithmic gray scale chart.
- Connect waveform monitor or terminated oscilloscope to VIDEO OUTPUT connector.
- Adjust data by **ARROW** keys so that signal level becomes 700 ± 50 mV (98 ± 7 IRE).

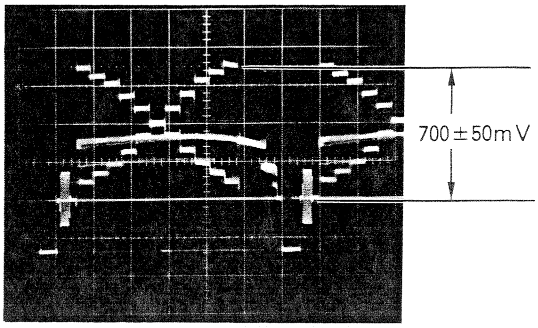
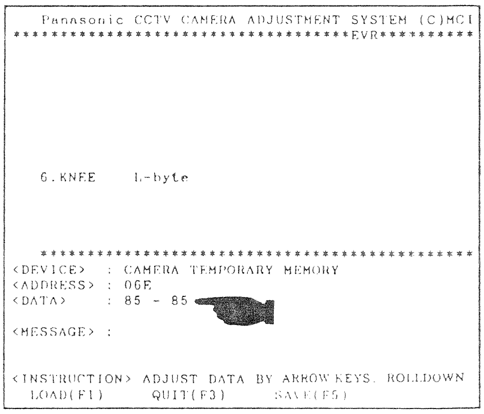


Fig. 4-8

- Press **ENTER** key.

(6) Knee level adjustment

Test Point : **VIDEO OUTPUT connector**
Adjust : **RAM (6E)**



```
Panasonic CCTV CAMERA ADJUSTMENT SYSTEM (C)MCI
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6.KNEE      L-byte


*************************************************
<DEVICE>   : CAMERA TEMPORARY MEMORY
<ADDRESS>  : 06E
<DATA>     : 85 - 85

<MESSAGE>  :

<INSTRUCTION> ADJUST DATA BY ARROW KEYS. ROLLDOWN
  LOAD(F1)       QUIT(F3)       SAVE(F5)
```

- Aim the camera at logarithmic gray scale chart.
- Connect waveform monitor or terminated oscilloscope to VIDEO OUTPUT connector.
- Adjust data by **ARROW** keys so that signal level becomes 840 $^{+35\text{mV}}_{-0}$ (117 $^{+35\text{mV}}_{-0}$ IRE).

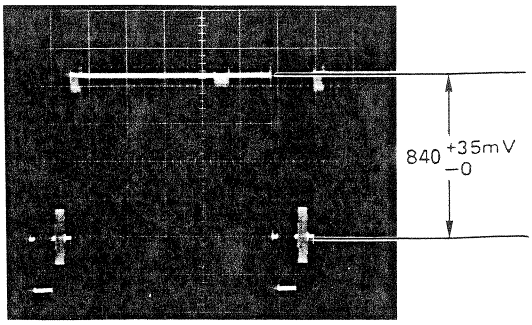
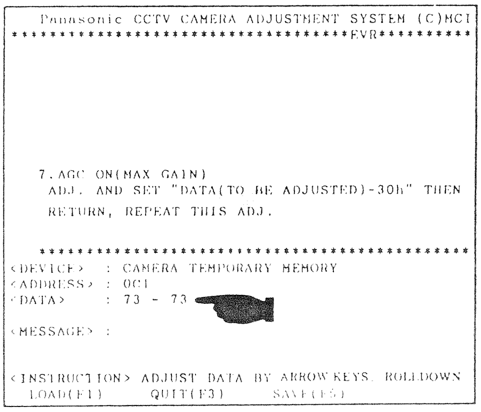


Fig. 4-9

(7) AGC ON (Max gain) adjustment

Test Point : **VIDEO OUTPUT connector**
Adjust : **RAM (C1)**



```
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   7.AGC ON(MAX GAIN)
    ADJ. AND SET "DATA(TO BE ADJUSTED)-30h" THEN
    RETURN, REPEAT THIS ADJ.

   ***********************************************
<DEVICE>   : CAMERA TEMPORARY MEMORY
<ADDRESS>  : 0C1
<DATA>     : 73 - 73

<MESSAGE>  :

<INSTRUCTION> ADJUST DATA BY ARROW KEYS. ROLLDOWN
  LOAD(F1)      QUIT(F3)      SAVE(F5)
```

- Change lighting from 1400 lux to 3 lux
- Aim the camera at logarithmic gray scale chart.
- Adjust data by **ARROW** keys so that signal level becomes 280 ± 35 mV (39.2 ± 4.9 IRE) , and note this data as (a).
- Re-adjust data by **ARROW** keys so that data becomes (b).
  (a)-30h = (b)

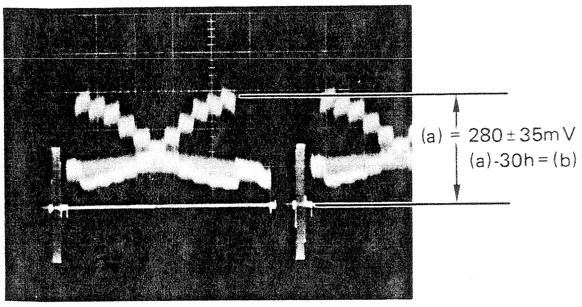
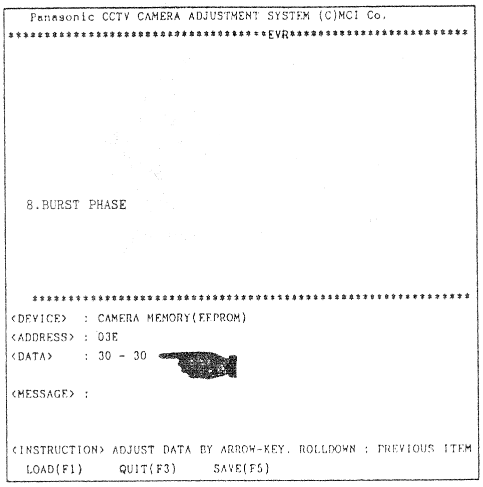


Fig.4-10

- Change lighting from 3 lux to 1400 lux.
- Press **ENTER** key.

(8) Burst phase adjustment

Test Point : **VIDEO OUTPUT connector**
Adjust : **EEPROM (3E)**



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  8.BURST PHASE

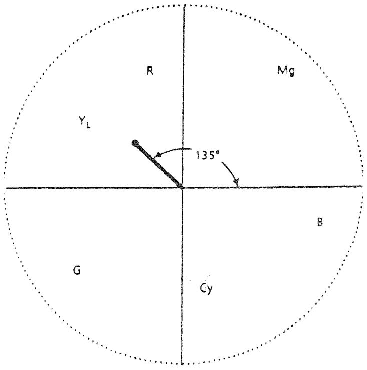


   ****************************************************************
<DEVICE>   : CAMERA MEMORY(EEPROM)
<ADDRESS>  : 03E
<DATA>     : 30 - 30

<MESSAGE>  :

<INSTRUCTION> ADJUST DATA BY ARROW-KEY. ROLLDOWN : PREVIOUS ITEM
  LOAD(F1)     QUIT(F3)     SAVE(F5)
```

- Adjust data by ARROW keys so that burst phase becomes 135°.

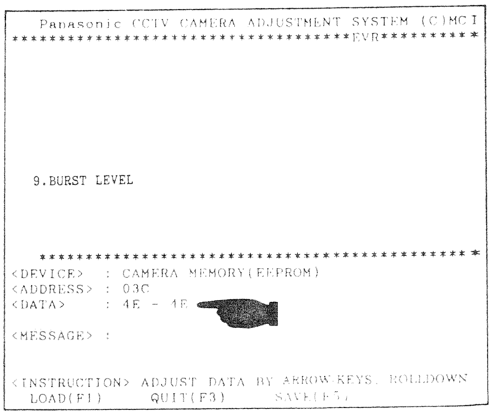


- Press **ENTER** key.

Fig. 4-11

(9) Burst level adjustment

Test Point : **VIDEO OUTPUT connector**
Adjust : **EEPROM (3C)**



```
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  9.BURST LEVEL



   ***********************************************
<DEVICE>   : CAMERA MEMORY(EEPROM)
<ADDRESS>  : 03C
<DATA>     : 4E - 4E

<MESSAGE>  :

<INSTRUCTION> ADJUST DATA BY ARROW-KEYS. ROLLDOWN
  LOAD(F1)      QUIT(F3)      SAVE(F5)
```

- Aim the camera at logarithmic gray scale chart.
- Adjust data by **ARROW** keys so that burst level becomes 300 ± 10 mV (42 ± 1.4 IRE).

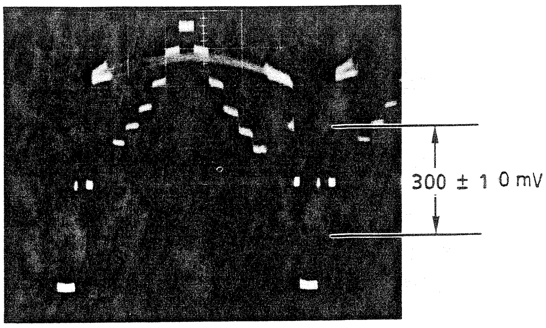
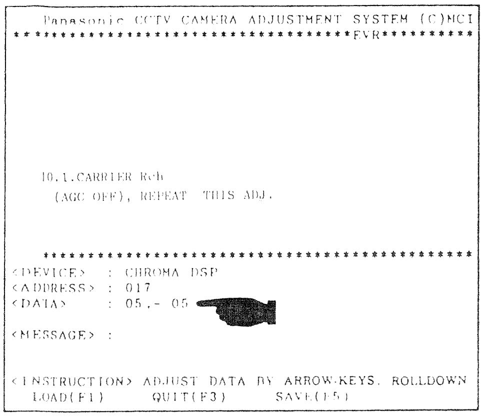


Fig. 4-12

- Press **ENTER** key.

(10)-1 R. Carrier balance adjustment (AGC-OFF)



```
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**************************************EVR**********




   10.1.CARRIER Rch
     (AGC OFF), REPEAT  THIS ADJ.

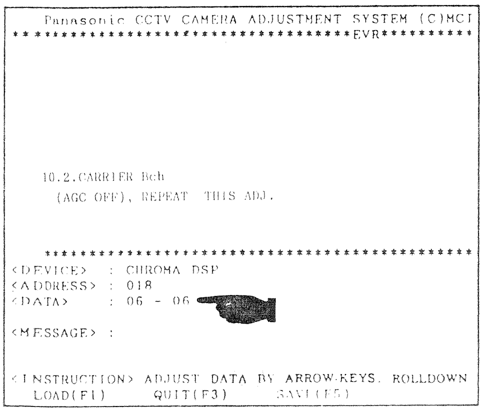

   *********************************************
<DEVICE>   : CHROMA DSP
<ADDRESS>  : 017
<DATA>     : 05 .- 05

<MESSAGE>  :


<INSTRUCTION> ADJUST DATA BY ARROW-KEYS. ROLLDOWN
  LOAD(F1)      QUIT(F3)      SAVE(F5)
```

- Adjust data by **ARROW** keys so that vector positions at the center of vectorscope.
- Press **ENTER** key.

(10)-2 B. Carrier balance adjustment (AGC-OFF)



```
   Panasonic CCTV CAMERA ADJUSTMENT SYSTEM (C)MCI
**************************************EVR**********




   10.2.CARRIER Bch
     (AGC OFF), REPEAT  THIS ADJ.


   *********************************************
<DEVICE>   : CHROMA DSP
<ADDRESS>  : 018
<DATA>     : 06 - 06

<MESSAGE>  :

<INSTRUCTION> ADJUST DATA BY ARROW-KEYS. ROLLDOWN
  LOAD(F1)      QUIT(F3)      SAVE(F5)
```

- Adjust data by **ARROW** keys so that vector positions at the center of vectorscope.
- Press **ENTER** key.
- If the vector does not position at the center of vectorscope, press **PG DN** key twice to return to 10, and repeat above procedure until vector positions at the center of vectorscope.

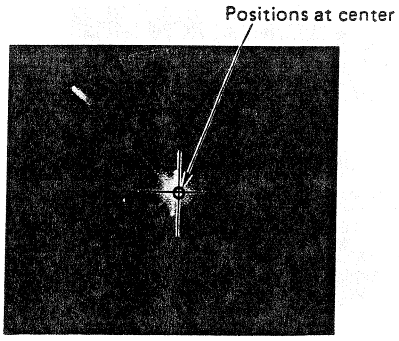
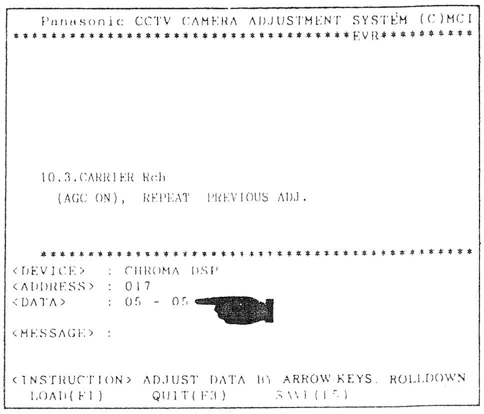


Fig. 4-13

(10)-3 R. Carrier balance adjustment (AGC-ON)



```
   Panasonic CCTV CAMERA ADJUSTMENT SYSTEM (C)MCI
**************************************EVR**********




   10.3.CARRIER Rch
     (AGC ON),  REPEAT  PREVIOUS ADJ.

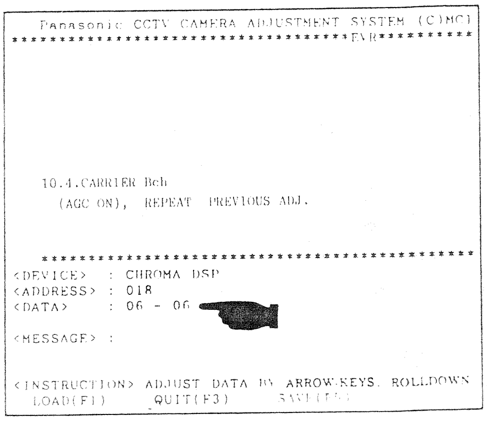

   *********************************************
<DEVICE>   : CHROMA DSP
<ADDRESS>  : 017
<DATA>     : 05 - 05

<MESSAGE>  :

<INSTRUCTION> ADJUST DATA BY ARROW-KEYS. ROLLDOWN
  LOAD(F1)      QUIT(F3)      SAVE(F5)
```

- Adjust data by **ARROW** keys so that vector positions at the center of vectorscope
- Press **ENTER** key.

(10)-4 B Carrier balance adjustment (AGC-ON)



```
   Panasonic CCTV CAMERA ADJUSTMENT SYSTEM (C)MCI
**************************************EVR**********




   10.4.CARRIER Bch
     (AGC ON),  REPEAT  PREVIOUS ADJ.


   *********************************************
<DEVICE>   : CHROMA DSP
<ADDRESS>  : 018
<DATA>     : 06 - 06

<MESSAGE>  :


<INSTRUCTION> ADJUST DATA BY ARROW-KEYS. ROLLDOWN
  LOAD(F1)      QUIT(F3)      SAVE(F5)
```

- Adjust data by **ARROW** keys so that vector positions at the center of vectorscope.
- Press **ENTER** key.
- If the vector does not position at the center of vectorscope, press **PG DN** key twice to return to 10, and repeat above procedure until vector positions at the center of vectorscope.

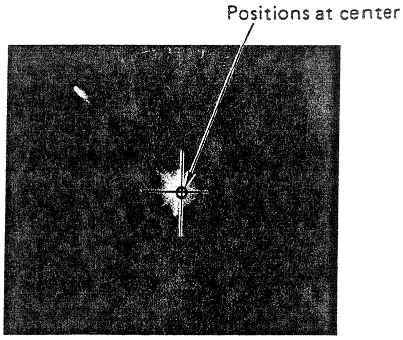


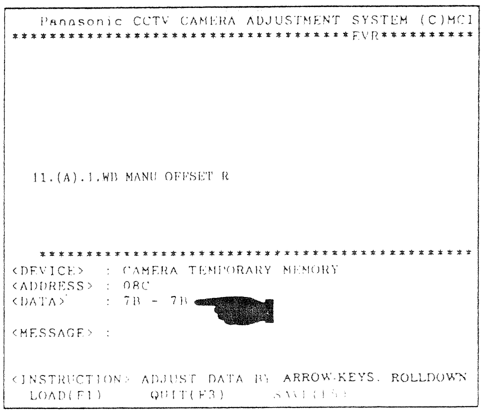
Fig. 4-14

(11)-A White balance manual offset adjustment

Test Point : VIDEO OUTPUT connector
Adjust : RAM (8C)
RAM (8D)

- Aim the camera at white chart.
- Set the gain of vectorscope to maximum.

(11)-A-1 R. White balance manual offset adjustment



```
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  11.(A).1.WB MANU OFFSET R



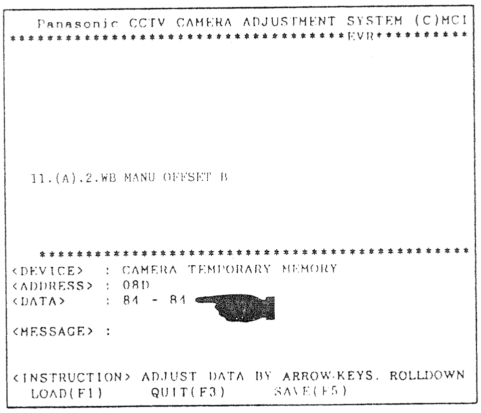
   **********************************************
<DEVICE>   : CAMERA TEMPORARY MEMORY
<ADDRESS>  : 08C
<DATA>     : 7B - 7B

<MESSAGE>  :

<INSTRUCTION> ADJUST DATA BY ARROW-KEYS. ROLLDOWN
  LOAD(F1)      QUIT(F3)      SAVE(F5)
```

- Adjust data by **ARROW** keys so that vector positions at the center of vectorscope.
- Press **ENTER** key.

(11)-A-2 B. White balance manual offset adjustment



```
   Panasonic CCTV CAMERA ADJUSTMENT SYSTEM (C)MCI
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  11.(A).2.WB MANU OFFSET B



   **********************************************
<DEVICE>   : CAMERA TEMPORARY MEMORY
<ADDRESS>  : 08D
<DATA>     : 84 - 84

<MESSAGE>  :

<INSTRUCTION> ADJUST DATA BY ARROW-KEYS. ROLLDOWN
  LOAD(F1)      QUIT(F3)      SAVE(F5)
```

- Adjust data by **ARROW** keys so that vector positions at the center of vectorscope.
- Press **ENTER** key.
- If the vector does not position at the center of vectorscope, press **PG DN** key twice to return to 11, and repeat above procedure until vector positions at the center of vectorscope.

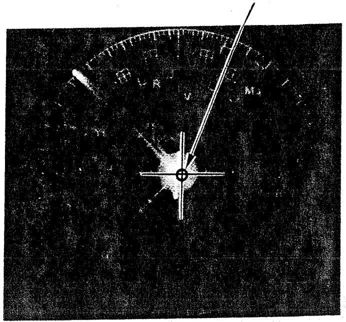


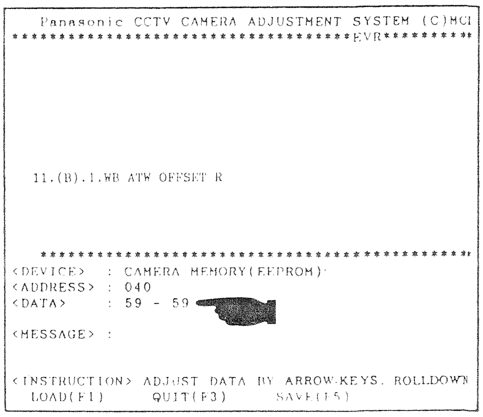
Fig. 4-15

(11)-B ATW offset adjustment

Test Point : VIDEO OUTPUT connector
Adjust : EEPROM (40) IC7
EEPROM (41) IC7

- Aim the camera at white chart.
- Set the gain of vectorscope to maximum.

(11)-B-1 R. ATW offset adjustment



```
   Panasonic CCTV CAMERA ADJUSTMENT SYSTEM (C)MCI
************************************EVR**********



  11.(B).1.WB ATW OFFSET R



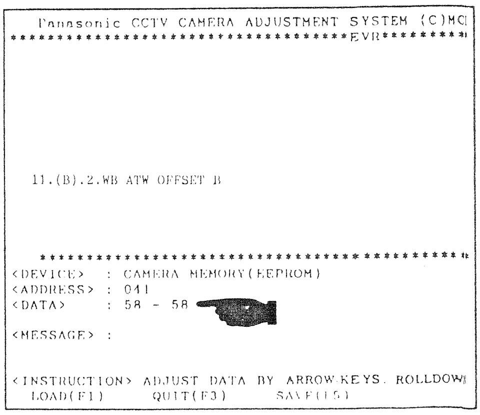
   **********************************************
<DEVICE>   : CAMERA MEMORY(EEPROM)
<ADDRESS>  : 040
<DATA>     : 59 - 59

<MESSAGE>  :

<INSTRUCTION> ADJUST DATA BY ARROW-KEYS. ROLLDOWN
  LOAD(F1)      QUIT(F3)      SAVE(F5)
```

- Adjust data by **ARROW** keys so that vector positions at the center of vectorscope.
- Press **ENTER** key.

(11)-B-2 B. ATW offset adjustment



```
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************************************EVR**********



  11.(B).2.WB ATW OFFSET B



   **********************************************
<DEVICE>   : CAMERA MEMORY(EEPROM)
<ADDRESS>  : 041
<DATA>     : 58 - 58

<MESSAGE>  :

<INSTRUCTION> ADJUST DATA BY ARROW-KEYS. ROLLDOW
  LOAD(F1)      QUIT(F3)      SAVE(F5)
```

- Adjust data by **ARROW** keys so that vector positions at the center of vectorscope.
- Press **ENTER** key.
- If the vector does not position at the center of vectorscope, press **PG DN** key twice to return to 11, and repeat above procedure until vector positions at the center of vectorscope.

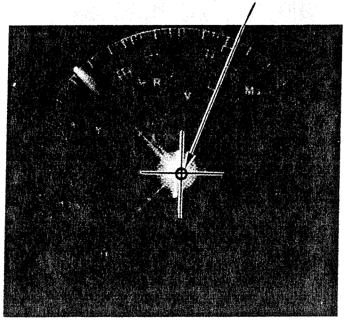

Positions at center

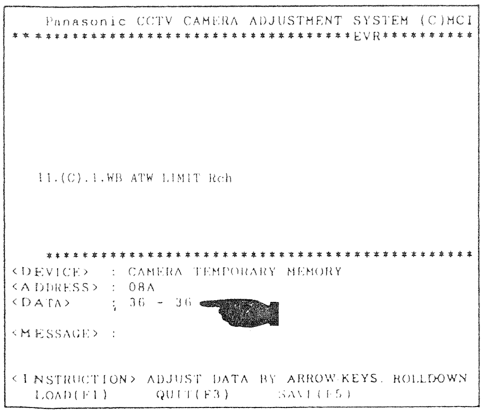
Fig. 4-16

(11)-C ATW limit adjustment

Test Point : VIDEO OUTPUT connector
Adjust : RAM (8A)
RAM (8B)

- Aim the camera at white chart.
- Set CC filter (C12 + C4) which converts form 3200°K to 6500°K in front of lens.

(11)-C-1 R. ATW offset adjustment



```
    Panasonic CCTV CAMERA ADJUSTMENT SYSTEM (C)MCI
*************************************EVR**********



  11.(C).1.WB ATW LIMIT Rch



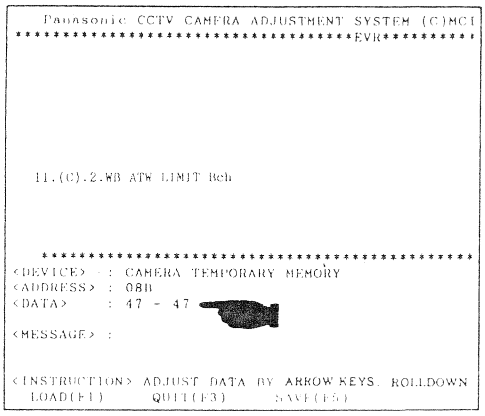
    *********************************************
<DEVICE>    : CAMERA TEMPORARY MEMORY
<ADDRESS>   : 08A
<DATA>      ; 36 - 36

<MESSAGE>   :


<INSTRUCTION> ADJUST DATA BY ARROW KEYS. ROLLDOWN
   LOAD(F1)      QUIT(F3)      SAVE(F5)
```

- Adjust data by **ARROW** keys so that vector positions at the center of vectorscope
- Press **ENTER** key.

(11)-C-2 B. ATW offset adjustment



```
   Panasonic CCTV CAMERA ADJUSTMENT SYSTEM (C)MCI
************************************EVR**********



  11.(C).2.WB ATW LIMIT Bch



    *********************************************
<DEVICE>    : CAMERA TEMPORARY MEMORY
<ADDRESS>   : 08B
<DATA>      : 47 - 47

<MESSAGE>   :


<INSTRUCTION> ADJUST DATA BY ARROW KEYS. ROLLDOWN
   LOAD(F1)      QUIT(F3)      SAVE(F5)
```

- Adjust data by **ARROW** keys so that vector shifts 10% (Burst = 100%) to Cyan side on vectorscope.
- Press **ENTER** key.
- If the vector does not shift 10% (Burst = 100%) to cyan side on vectorscope, press **PG DN** key twice to return to (15)-C-1, and repeat above procedure until vector shifts 10% to cyan side on vectorscope.

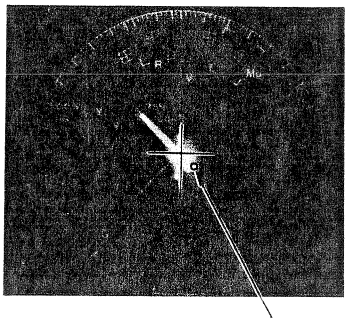

Shifted approx. 10%

Fig. 4-17

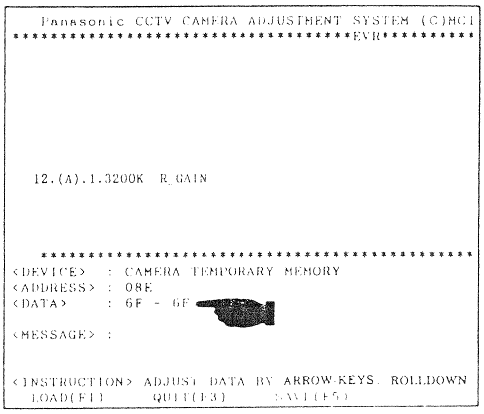
- Remove CC filter from in front of lens.

(12)-A White balance adjustment (3200°K)

Test Point : VIDEO OUTPUT connector
Adjust : RAM (8E)
RAM (8F)
RAM (18B)

- Aim the camera at color chip chart.
- Set the gain of vectorscope to 75% position.

(12)-A-1 R. Gain adjustment



```
   Panasonic CCTV CAMERA ADJUSTMENT SYSTEM (C)MCI
*************************************EVR**********



  12.(A).1.3200K  R_GAIN



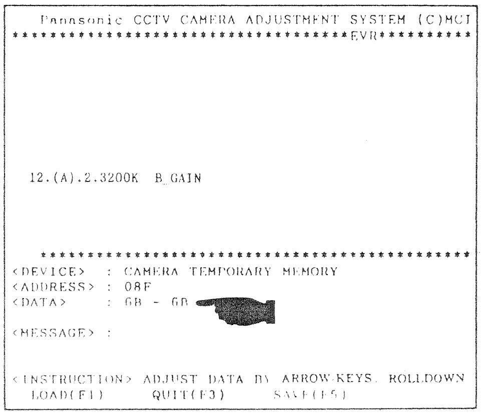
   *********************************************
<DEVICE>   : CAMERA TEMPORARY MEMORY
<ADDRESS>  : 08E
<DATA>     : 6F - 6F

<MESSAGE>  :

<INSTRUCTION> ADJUST DATA BY ARROW-KEYS. ROLLDOWN
  LOAD(F1)      QUIT(F3)      SAVE(F5)
```

- Adjust data by **ARROW** keys so that red gain becomes 200 ± 5% (Burst = 100 %)
- Press **ENTER** key.

(12)-A-2 B. Gain adjustment



```
   Panasonic CCTV CAMERA ADJUSTMENT SYSTEM (C)MCI
*************************************EVR**********



  12.(A).2.3200K  B_GAIN



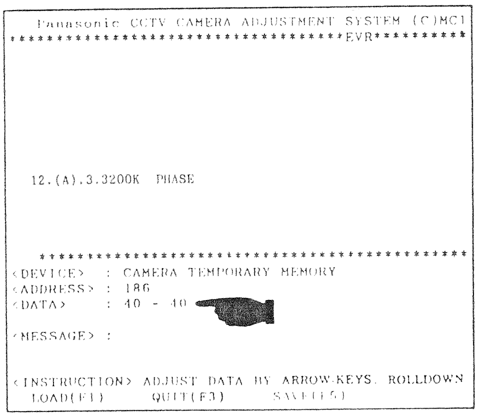
   *********************************************
<DEVICE>   : CAMERA TEMPORARY MEMORY
<ADDRESS>  : 08F
<DATA>     : 6B - 6B

<MESSAGE>  :

<INSTRUCTION> ADJUST DATA BY ARROW-KEYS. ROLLDOWN
  LOAD(F1)      QUIT(F3)      SAVE(F5)
```

- Adjust data by **ARROW** keys so that yellow gain becomes 100 ± 5% (Burst = 100%).
- Press **ENTER** key.

(12)-A-3 Chroma phase adjustment



```
   Panasonic CCTV CAMERA ADJUSTMENT SYSTEM (C)MCI
*************************************EVR**********



  12.(A).3.3200K  PHASE



   *********************************************
<DEVICE>   : CAMERA TEMPORARY MEMORY
<ADDRESS>  : 186
<DATA>     : 40 - 40

<MESSAGE>  :

<INSTRUCTION> ADJUST DATA BY ARROW-KEYS. ROLLDOWN
  LOAD(F1)      QUIT(F3)      SAVE(F5)
```

- Adjust data by **ARROW** keys so that yellow vector becomes 157 ± 5°.
- Press **ENTER** key.
- If the chrominance phase and gain should not be adjusted to proper position, press **PG DN** key 3 times to return to (16)-A-1, and repeat above procedure until they are adjusted to proper position as shown in table -2.

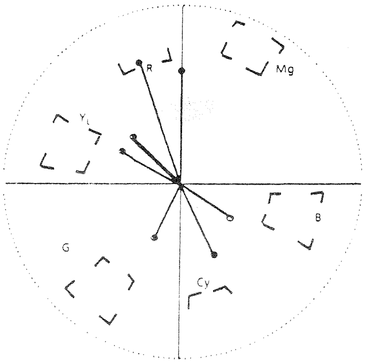


Fig-4-18

	Red	Yellow
Phase	104 ± 2°	157 ± 5°
gain	200 ± 5%	100 ± 5%

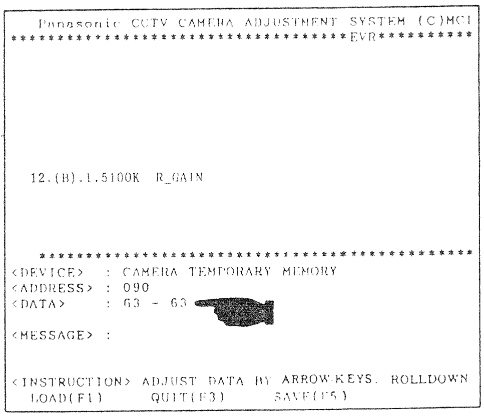
Table-2

(12)-B White balance adjustment (5100°K)

Test Point : VIDEO OUTPUT connector
Adjust : RAM (90)
RAM (91)

- Aim the camera at color chip chart.
- Set CC filter (C12) which converts form 3200°K to 5 100°K in front of lens.

(12)-B-1 R. Gain adjustment



```
   Panasonic CCTV CAMERA ADJUSTMENT SYSTEM (C)MCI
*************************************EVR**********



  12.(B).1.5100K  R_GAIN



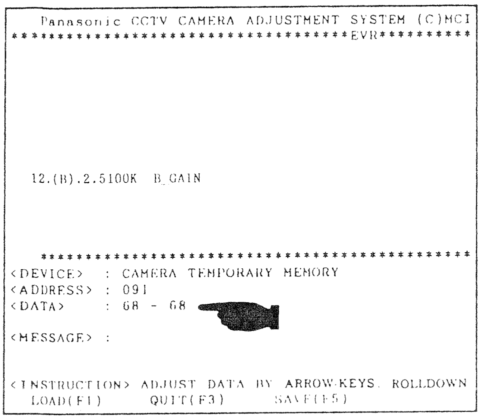
   *********************************************
<DEVICE>   : CAMERA TEMPORARY MEMORY
<ADDRESS>  : 090
<DATA>     : 63 - 63

<MESSAGE>  :

<INSTRUCTION> ADJUST DATA BY ARROW-KEYS. ROLLDOWN
  LOAD(F1)      QUIT(F3)      SAVE(F5)
```

- Adjust data by **ARROW** keys so that red gain becomes 200 ± 5% (Burst = 100%) .
- Press **ENTER** key.

(12)-B-2 B. Gain adjustment



```
Panasonic CCTV CAMERA ADJUSTMENT SYSTEM (C)MCI
*************************************EVR**********

12.(B).2.5100K  B.GAIN

**********************************************
<DEVICE>   : CAMERA TEMPORARY MEMORY
<ADDRESS>  : 091
<DATA>     : 68 - 68

<MESSAGE>  :

<INSTRUCTION> ADJUST DATA BY ARROW-KEYS. ROLLDOWN
  LOAD(F1)        QUIT(F3)        SAVE(F5)
```

- Adjust data by **ARROW** keys so that yellow gain becomes 90 ± 5%(Burst = 100%).
- Press **ENTER** key.
- If the chrominance gain and phase should not be adjusted to proper position, press **PG DN** key twice to return to (16)-B-1, and repeat above procedure until they are adjusted to proper position as shown in table 3.

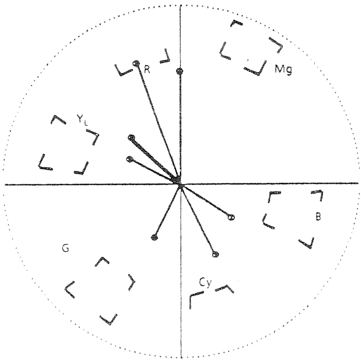


Fig-4-19

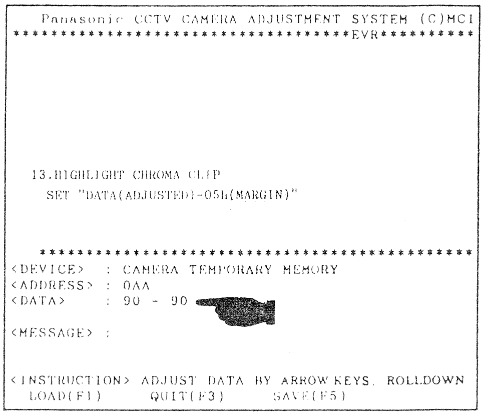
	Red	Yellow
Phase	104 ± 2°	157 ± 5°
gain	200 ± 5%	90 ± 5%

Table-3

- Remove CC filter (C12) from in front of lens.

(13) Highlight chroma clip

Test Point : VIDEO OUTPUT connector
Adjust : RAM (AA)



```
Panasonic CCTV CAMERA ADJUSTMENT SYSTEM (C)MCI
*************************************EVR**********

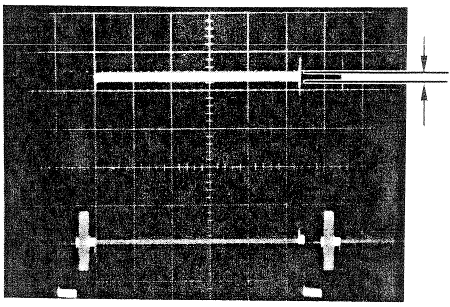
13.HIGHLIGHT CHROMA CLIP
  SET "DATA(ADJUSTED)-05h(MARGIN)"

**********************************************
<DEVICE>   : CAMERA TEMPORARY MEMORY
<ADDRESS>  : 0AA
<DATA>     : 90 - 90

<MESSAGE>  :

<INSTRUCTION> ADJUST DATA BY ARROW KEYS. ROLLDOWN
  LOAD(F1)        QUIT(F3)        SAVE(F5)
```

- Aim the camera at white chart.
- Adjust data by **ARROW** keys so that chrominance level becomes minimum, and note this data as (a).
- Re-adjust data by **ARROW** keys so that data becomes (b).
  (a)-05h = (b)

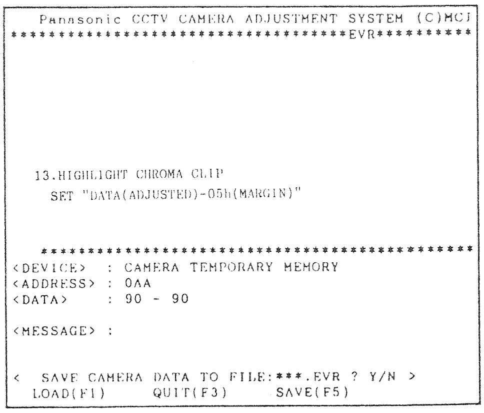


Minimize chrominance level (a)

(a)-05h=(b)

Fig. 4-20

- Aafter finishing adjustment, press **QUIT (F3)**.



```
Panasonic CCTV CAMERA ADJUSTMENT SYSTEM (C)MCI
*************************************EVR**********

13.HIGHLIGHT CHROMA CLIP
  SET "DATA(ADJUSTED)-05h(MARGIN)"

**********************************************
<DEVICE>   : CAMERA TEMPORARY MEMORY
<ADDRESS>  : 0AA
<DATA>     : 90 - 90

<MESSAGE>  :

<  SAVE CAMERA DATA TO FILE:***.EVR ? Y/N  >
  LOAD(F1)        QUIT(F3)        SAVE(F5)
```

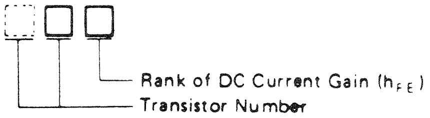
- Press **N** and **ENTER** to finish

- Disconnect cable from CN6 on the digital board.
- Confirm that masking is off.

CHIP COMPONENTS

1. Chip Transistor

The transistor number is indicated on the top surface of the chip transistor using two alphabet letters or one numerical and two alphabet letters.


Rank of DC Current Gain (h_{FE})
Transistor Number

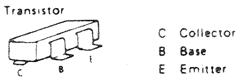
Transistor Number

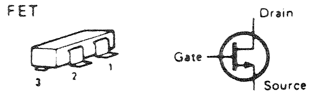
Letter	Transistor No.	Letter	Transistor No.
A	2SB709	X	2SD602A
B	2SB709A	Y	2SD601
C	2SB710	Z	2SD601A
D	2SB710A	1Z	2SD1030
E	2SA1022	1N	2SK199
F	2SA1034	1O	2SK198
H	2SA1035	1A	2SB799
I	2SB792	1B	2SB814
K	2SC2778	1C	2SB902
P	2SD814	1F	2SK321
Q	2SD813	1L	2SK247
R	2SC2480	1K	2SK316
S	2SC2405	1M	2SJ84
T	2SC2406	1T	2SC3077
U	2SC2404	1X	2SC2845
V	2SC2295	2B	2SK374
W	2SD602	2C	2SK116

Example

WQ ⟶ 2SD602 – Q
YQ ⟶ 2SD601 – Q
1BS ⟶ 2SB814 – S

Appearance and Symbols

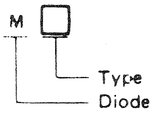

Transistor
C
B
E
C Collector
B Base
E Emitter


FET
3
2
1
Drain
Gate
Source

	1	2	3
Except 2SK199	Drain	Source	Gate
2SK199	Gate	Drain	Source

2. Chip Diode

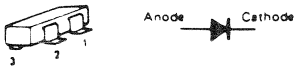
The diode number is indicated on the top surface of the chip diode using Two alphabet letters.


M
Type
Diode

Diode Number

Letter	Diode No.	Letter	Diode No.
MA	MA151A	MI	MA152K
MB	MA152A	MK	MA28W-B
MC	MA153	ML	MA28T-A
MD	MA28-A	MN	MA151WA
ME	MA28-B	MO	MA152WA
MF	MA28W-A	MT	MA151WK
MH	MA151K	MU	MA152WK

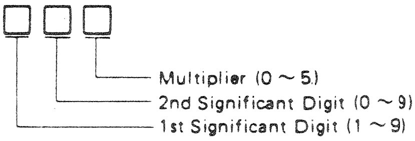
Appearance and Symbols


3
2
1
Anode
Cathode

	1	2	3
MA28/28W/28T	–	Anode	Cathode
MA151K/152K	–	Anode	Cathode
MA151A/152A	–	Cathode	Anode
MA151WK/MA152WK	Anode	Anode	Cathode
MA151WA/MA152WA	Cathode	Cathode	Anode
MA153	Cathode	Anode	Common

3. Chip Resistor

The resistor value is indicated on the bottom surface of the chip resistor using three digit numbers.


Multiplier (0 ~ 5)
2nd Significant Digit (0 ~ 9)
1st Significant Digit (1 ~ 9)

EXAMPLE:

330 ⟶ $33 \times 10^0 = 33$ ohms
561 ⟶ $56 \times 10^1 = 560$ ohms
123 ⟶ $12 \times 10^3 = 12$ kohms

Note: Zero ohm resistor (jumper chip) is colored red or green.

4. Chip Capacitor

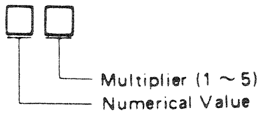
The capacitive value of replacement chip capacitors is indicated on the bottom surface. Original parts do not have value indication.

If the capacitive value is less than 100 pF, the value will be indicated by one or two digit number expressing the capacity directly in pF.

EXAMPLE:

0.5 ⟶	0.5 pF	2.5 ⟶	2.5 pF
75 ⟶	0.75 pF	33 ⟶	33 pF
1 ⟶	1 pF	82 ⟶	82 pF

If the capacitive value is 100 pF or greater, the value will be indicated by an alpha-numeric code. The letter precedes the number and expresses a numerical value to be multiplied by the number which follows.


Multiplier (1 ~ 5)
Numerical Value

Numerical Value

Letter	Value	Letter	Value
A	10	N	33
B	11	P	36
C	12	Q	39
D	13	R	43
E	15	S	47
F	16	T	51
G	18	U	56
H	20	V	62
J	22	W	68
K	24	X	75
L	27	Y	82
M	30	Z	91

* Letters I and O are not used

EXAMPLE:

A1 $\longrightarrow$ $10 \times 10^1 = 100$ pF

N2 $\longrightarrow$ $33 \times 10^2 = 3300$ pF

S3 $\longrightarrow$ $47 \times 10^3 = 47000$ pF

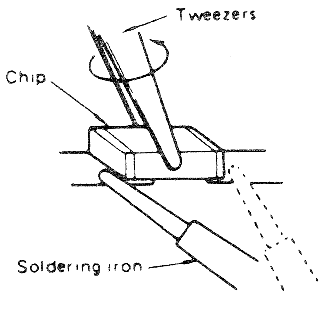
5. Precautions in replacing the chip component

1. Make sure that the unit is turned OFF when replacing the chip
2. Use tweezers to prevent any damage to the chip surface
3. Do not re-use the chips after removal
4. Do not rub the electrode of chips
5. Do not subject the chips to excessive stress
6. It is recommended that a pencil-type soldering iron to be used
7. Solder with a diameter of less than 0.5 mm is recommended
8. Do not heat the chip beyond 3 seconds
9. Maintain temperature control under 260°C (500°F) when soldering

5-1 Removal (Transistor, Diode, Resistor and Capacitor)

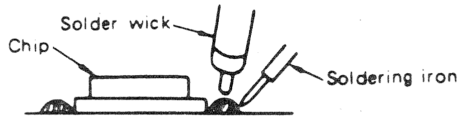
1. Add the solder to both ends of the chip (three leads for chip transistor).
2. While attaching the soldering iron to both ends of the chip (three leads for chip transistor) as shown below, remove the chip by turning it with tweezers

   Note Be careful not to damage other chips

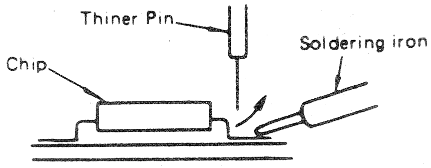

Tweezers
Chip
Soldering iron

5-2 Removal (IC)

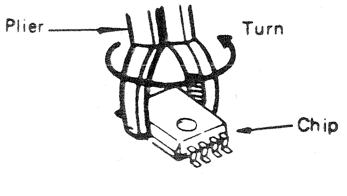
1. Add the solder wick and solder iron to each lead of the IC and remove solder.


Solder wick
Chip
Soldering iron

2. Add the solder iron to each lead of the IC and lift each lead of the IC using thiner pin.

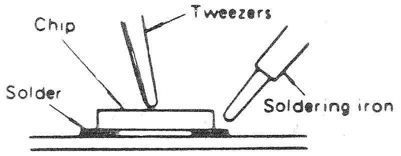

Thiner Pin
Soldering iron
Chip

3. Remove IC turning it with plier.

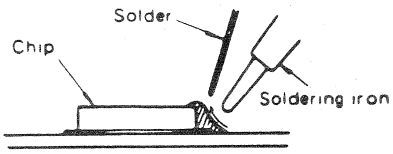

Plier
Turn
Chip

5-3 Mounting

1. Place the solder thinly on the chip mounting foil.
2. Solder the chip temporarily while holding the chip with the tweezers

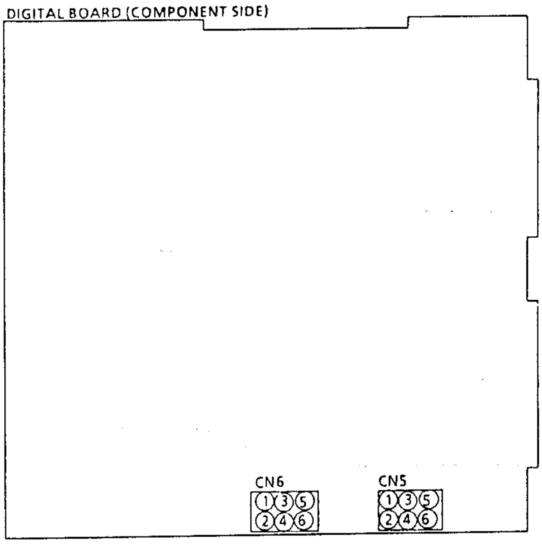

Tweezers
Chip
Solder
Soldering iron

3. Solder both ends of chip (three leads for chip transistor)

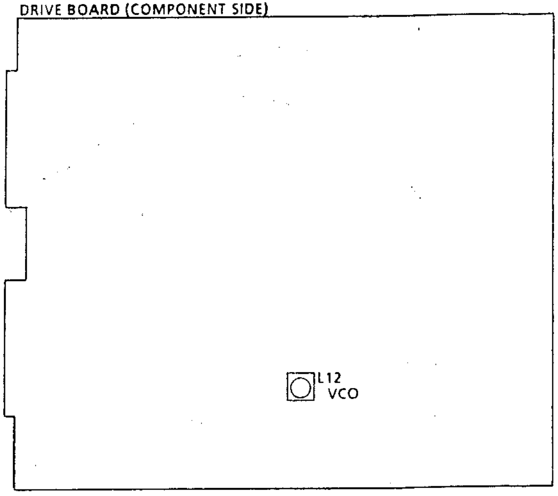

Solder
Chip
Soldering iron

LOCATION OF TEST POINTS AND ADJUSTING CONTROLS

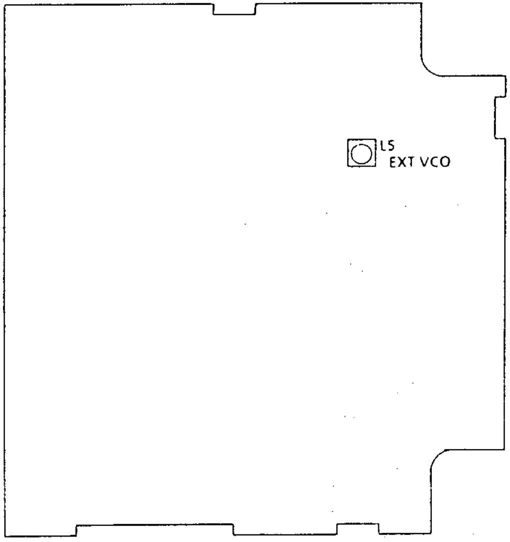
DIGITAL BOARD (COMPONENT SIDE)


CN6
1 3 5
2 4 6
CN5
1 3 5
2 4 6

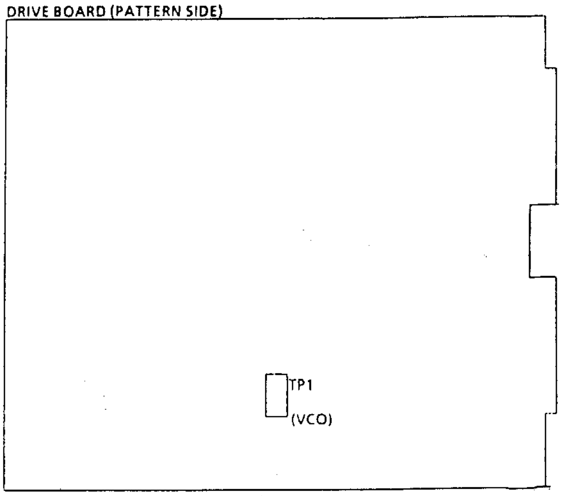
WV-CL352
DRIVE BOARD (COMPONENT SIDE)



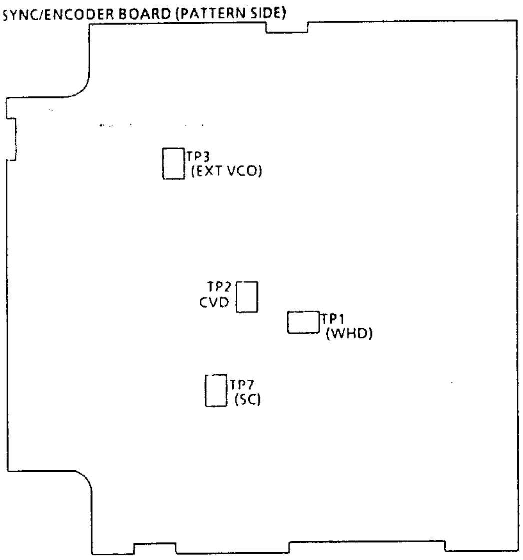
SYNC/ENCODER BOARD (COMPONENT SIDE)



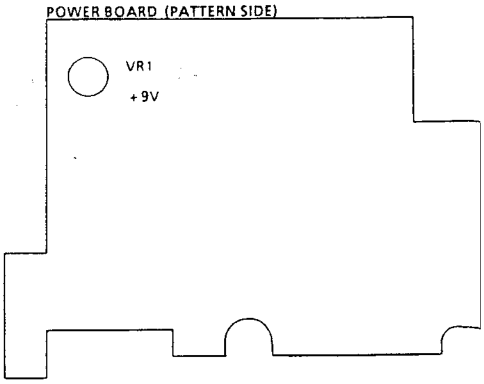
WV-CL352
DRIVE BOARD (PATTERN SIDE)



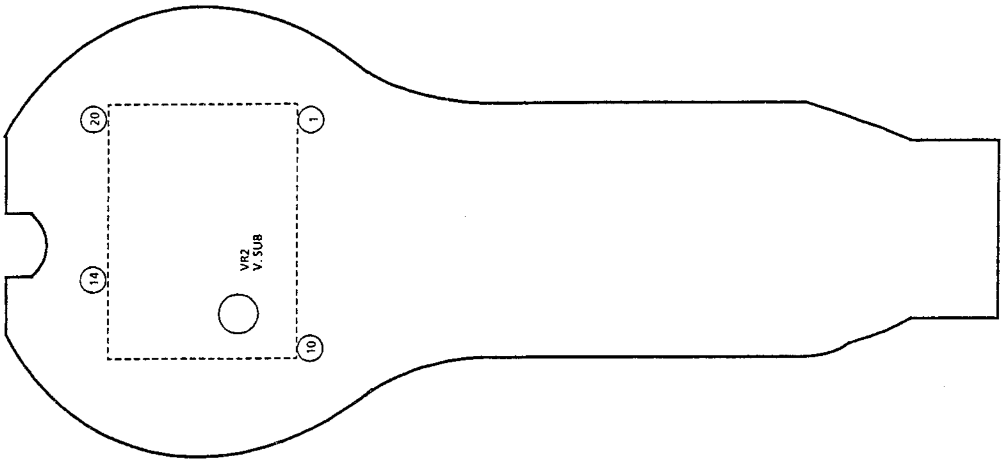
SYNC/ENCODER BOARD (PATTERN SIDE)


TP3
(EXT VCO)
TP2
CVD
TP1
(WHD)
TP7
(SC)

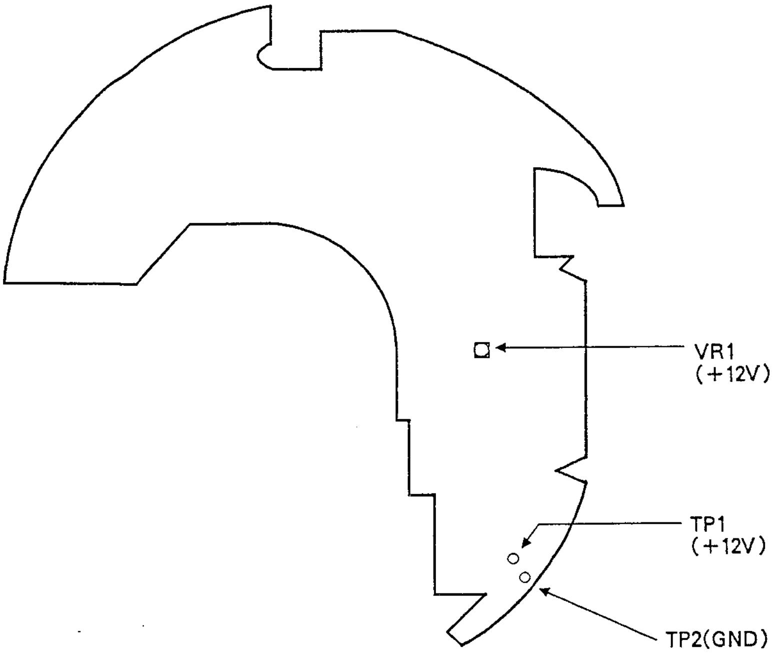
WV-CL352
POWER BOARD (PATTERN SIDE)



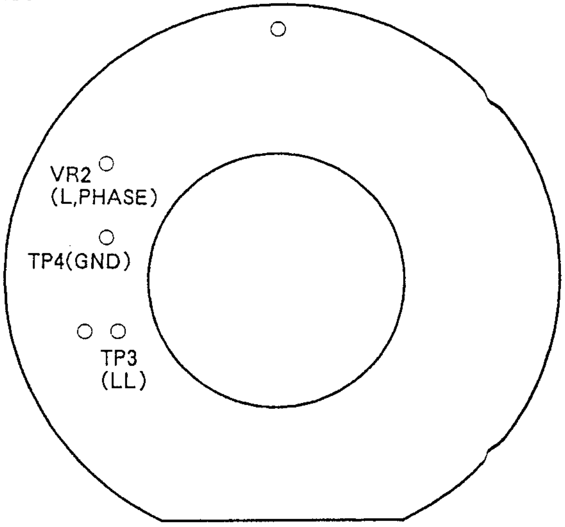
SENSOR BOARD


20
1
14
10
VR2
V.SUB

CONTROL BOARD

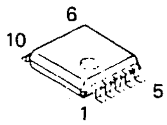

VR1
(+12V)
TP1
(+12V)
TP2(GND)

RECIEVER BOARD

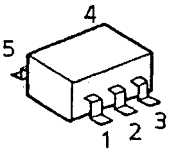

VR2
(L,PHASE)
TP4(GND)
TP3
(LL)

APPEARANCE OF IC, TRANSISTOR AND DIODE

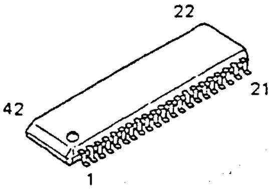
YWM6M80021FP
YWM62352GP



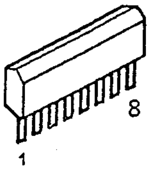
YWTC7S08S M5237MLT1
YWTC7S32FR YWTC4S11F
YWTC4S69F YWTC7S04F



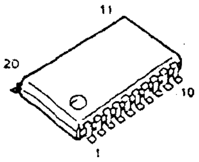
M50554254PF
YWM51957BFP



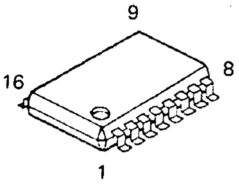
YWM5295L



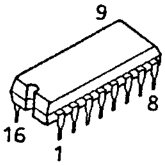
MN53003LBJ



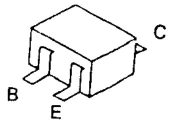
MC74HC4538F
MC74HC4052F
YWUPD16501GS



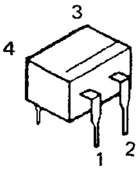
LB1648



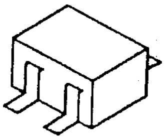
2SC2412-QRS 2SB1218-QRS
DTC114YU 2SB1462
2SC3802 2SC4618
2SA1733 2SC4627
2SC4081 2SD2216
2SA1U37-QRS FA3L4ZT1B
2SA1576



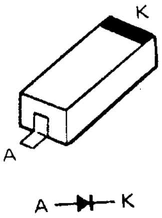
PS25011KL



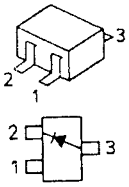
MN13821PQR



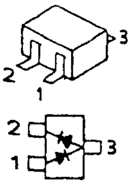
MA729



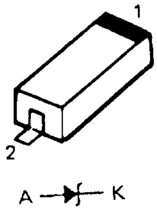
MA132K



MA133

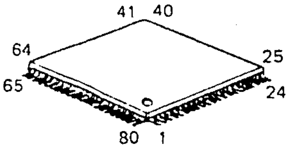


MA8110
MA8200

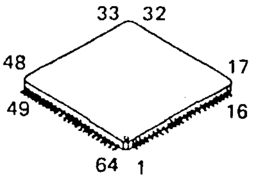


APPEARANCE OF IC, TRANSISTOR AND DIODE

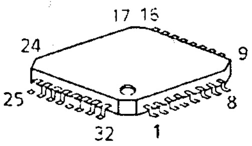
MN73069LBM2
MN6430FHP
MN6731FHP
MN188166CUA


41 40
64
25
65
24
80 1

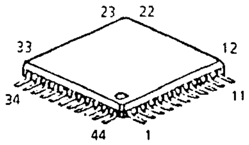
AN2254FAP
MN65701FHP
YWMB621488U


33 32
48
17
49
16
64 1

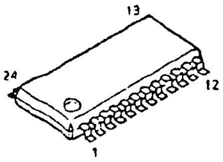
AN2015FAP


17 16
24
9
25
8
32
1

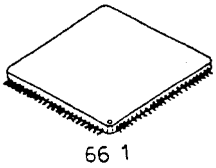
MN53020LB01


23 22
33
12
34
11
44
1

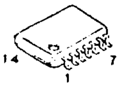
YWHD74HC673P
YWCXD1175AM



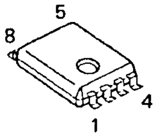
YWD75116FF10
YWCF37808PG



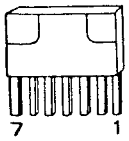
YWMC74HC14F
YWMC74HC02AF
YWMC74HC08F
YWMC74HC32F



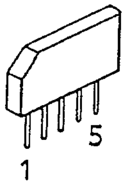
YWS24S301F
YWCXA1439M
NJM2904M
NJM3414M
NJM4558M
NJM2903M
NJM2901M
YWM51957BFP



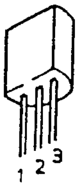
YWDA120



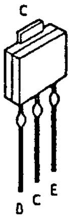
YWRBA406B



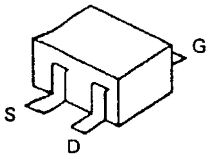
NJM78L05A
M5237MLT1



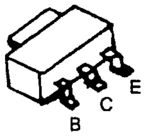
2SK612



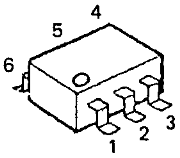
2SK622-PQR



2SB766-RS

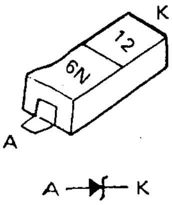


XP1501
XP4501
IMZ1T9
IMX3T9
IMT1T10

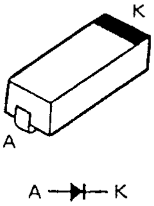


2SC2021
2SC4776MRS
2SA937MQRS
2SB909MPQR

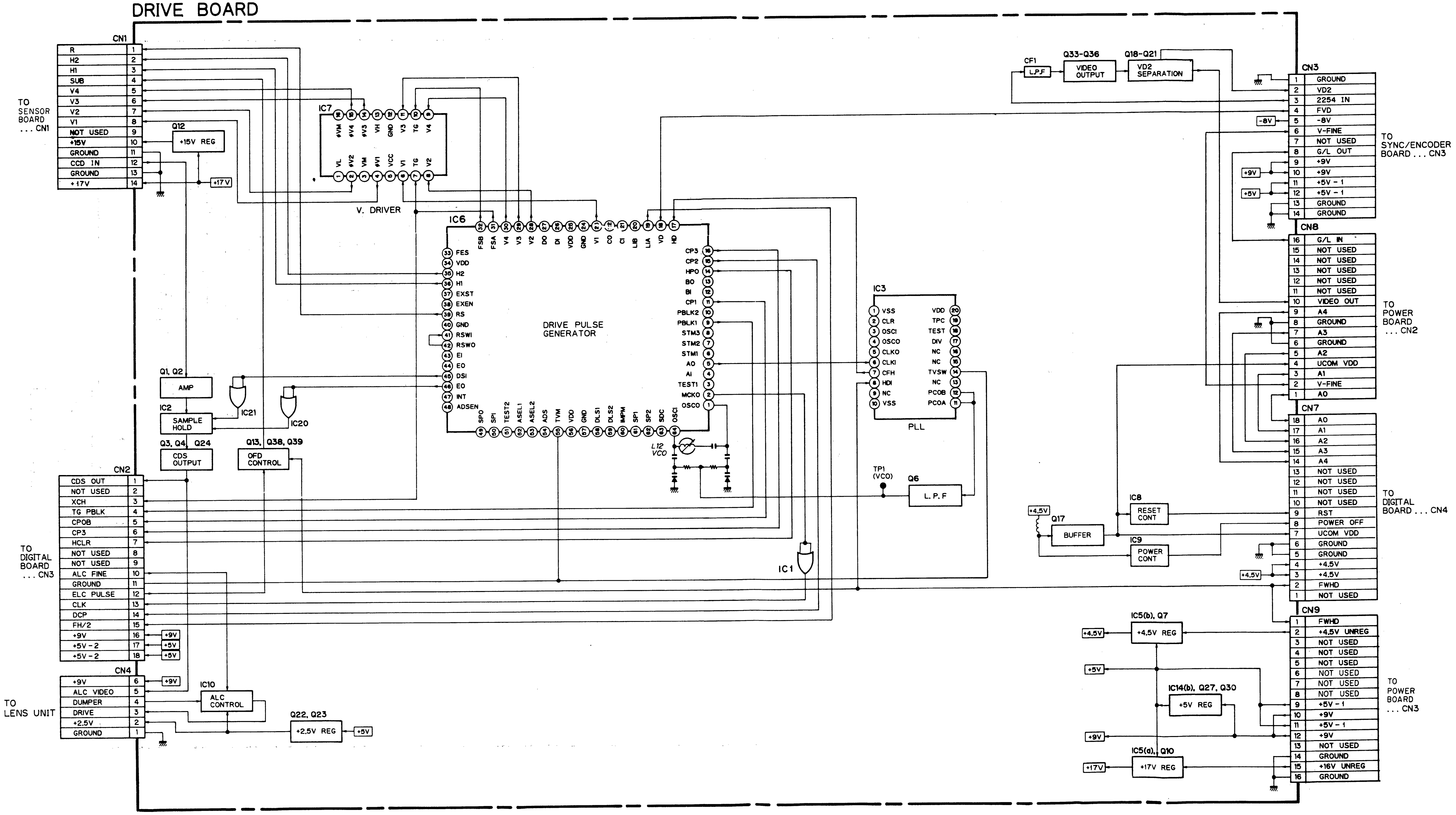
MA372



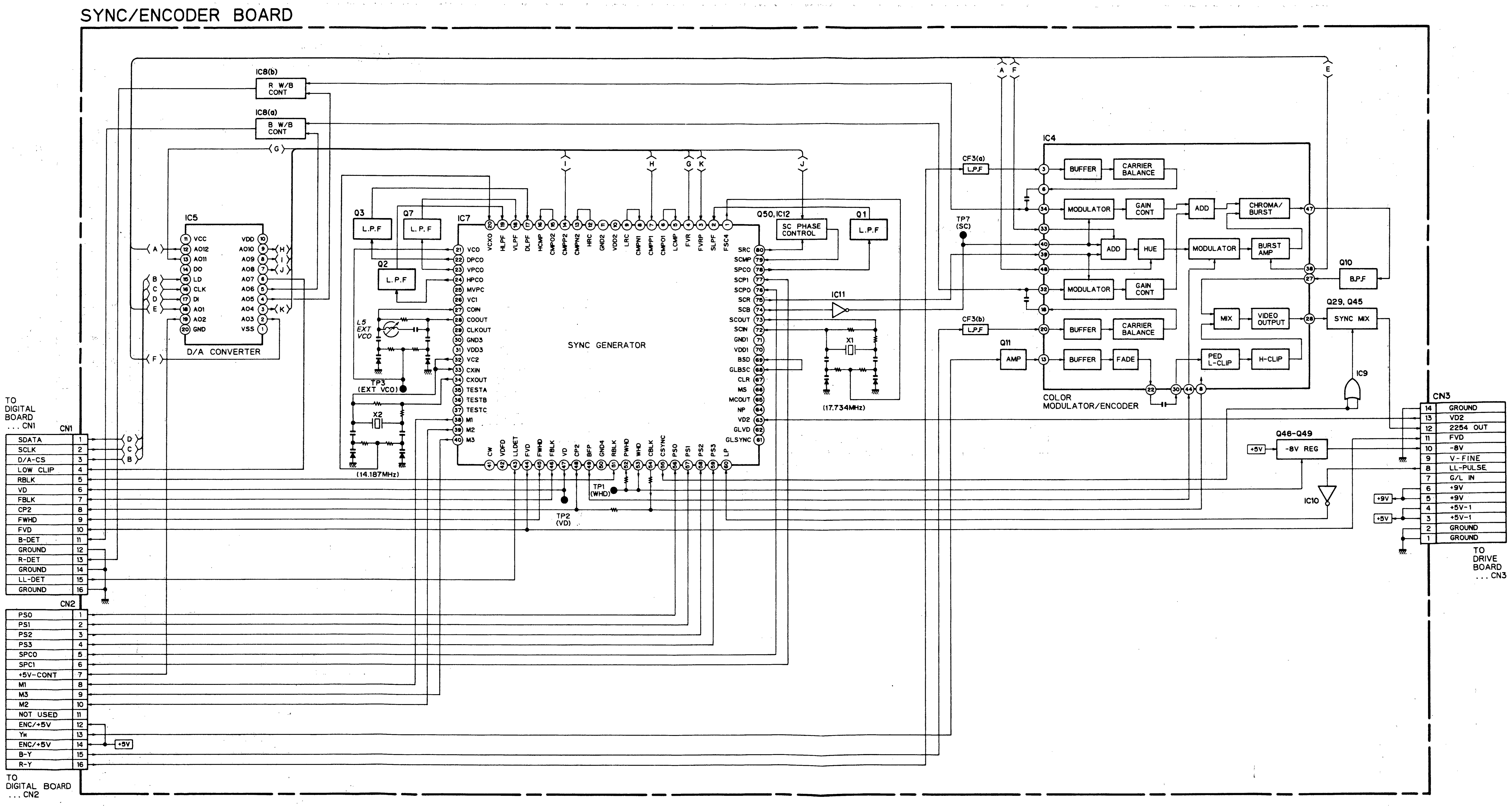
YWF1H4TP



BLOCK DIAGRAM OF DRIVE BOARD


DRIVE BOARD
CN1
1 R
2 H2
3 H1
4 SUB
5 V4
6 V3
7 V2
8 V1
9 NOT USED
10 +15V
11 GROUND
12 CCD IN
13 GROUND
14 +17V
TO SENSOR BOARD ... CN1
Q12
+15V REG
+17V
IC7
16 φVM
15 φV4
14 φV3
13 VH
12 GND
11 V3
10 TG
9 V4
1 VL
2 φV2
3 VM
4 φV1
5 VCC
6 V1
7 TG
8 V2
V. DRIVER
IC6
32 FSB
31 FSA
30 V4
29 V3
28 V2
27 DO
26 DI
25 VDD
24 GND
23 V1
22 CO
21 CI
20 LIB
19 LIA
18 VD
17 HD
33 FES
34 VDD
35 H2
36 H1
37 EXST
38 EXEN
39 RS
40 GND
41 RSWI
42 RSWO
43 EI
44 EO
45 DSI
46 EO
47 INT
48 ADSEN
16 CP3
15 CP2
14 HPO
13 BO
12 BI
11 CP1
10 PBLK2
9 PBLK1
8 STM3
7 STM2
6 STM1
5 AO
4 AI
3 TEST1
2 MCKO
1 OSCO
DRIVE PULSE GENERATOR
49 SPO
50 SPI
51 TEST2
52 ASEL1
53 ASEL2
54 ADS
55 TVM
56 VDD
57 GND
58 DLS1
59 DLS2
60 IMPM
61 SP1
62 SP2
63 SDC
64 OSCI
L12 VCO
Q1, Q2
AMP
IC2
SAMPLE HOLD
IC21
IC20
Q3, Q4, Q24
CDS OUTPUT
Q13, Q38, Q39
OFD CONTROL
IC3
1 VSS
2 CLR
3 OSCI
4 OSCO
5 CLKO
6 CLKI
7 CFH
8 HDI
9 NC
10 VSS
20 VDD
19 TPC
18 TEST
17 DIV
16 NC
15 NC
14 TVSW
13 NC
12 PCOB
11 PCOA
PLL
TP1 (VCO)
Q6
L. P. F
IC1
CN2
1 CDS OUT
2 NOT USED
3 XCH
4 TG PBLK
5 CPOB
6 CP3
7 HCLR
8 NOT USED
9 NOT USED
10 ALC FINE
11 GROUND
12 ELC PULSE
13 CLK
14 DCP
15 FH/2
16 +9V
17 +5V - 2
18 +5V - 2
TO DIGITAL BOARD ... CN3
+9V
+5V
+5V
CN4
6 +9V
5 ALC VIDEO
4 DUMPER
3 DRIVE
2 +2.5V
1 GROUND
TO LENS UNIT
+9V
IC10
ALC CONTROL
Q22, Q23
+2.5V REG
+5V
CF1
L.P.F
Q33-Q36
VIDEO OUTPUT
Q18-Q21
VD2 SEPARATION
CN3
1 GROUND
2 VD2
3 2254 IN
4 FVD
5 -8V
6 V-FINE
7 NOT USED
8 G/L OUT
9 +9V
10 +9V
11 +5V - 1
12 +5V - 1
13 GROUND
14 GROUND
-8V
+9V
+5V
TO SYNC/ENCODER BOARD ... CN3
CN8
16 G/L IN
15 NOT USED
14 NOT USED
13 NOT USED
12 NOT USED
11 NOT USED
10 VIDEO OUT
9 A4
8 GROUND
7 A3
6 GROUND
5 A2
4 UCOM VDD
3 A1
2 V-FINE
1 AO
TO POWER BOARD ... CN2
CN7
18 AO
17 A1
16 A2
15 A3
14 A4
13 NOT USED
12 NOT USED
11 NOT USED
10 NOT USED
9 RST
8 POWER OFF
7 UCOM VDD
6 GROUND
5 GROUND
4 +4.5V
3 +4.5V
2 FWHD
1 NOT USED
TO DIGITAL BOARD ... CN4
+4.5V
IC8
RESET CONT
+4.5V
Q17
BUFFER
IC9
POWER CONT
CN9
1 FWHD
2 +4.5V UNREG
3 NOT USED
4 NOT USED
5 NOT USED
6 NOT USED
7 NOT USED
8 NOT USED
9 +5V - 1
10 +9V
11 +5V - 1
12 +9V
13 NOT USED
14 GROUND
15 +16V UNREG
16 GROUND
TO POWER BOARD ... CN3
IC5(b), Q7
+4.5V REG
+4.5V
+5V
IC14(b), Q27, Q30
+5V REG
+9V
IC5(a), Q10
+17V REG
+17V

BLOCK DIAGRAM OF SYNC/ENCODER BOARD


SYNC/ENCODER BOARD
IC8(b)
R W/B CONT
IC8(a)
B W/B CONT
IC5
VCC
AO12
AO11
DO
LD
CLK
DI
AO1
AO2
GND
VDD
AO10
AO9
AO8
AO7
AO6
AO5
AO4
AO3
VSS
D/A CONVERTER
Q3
L.P.F
Q7
L.P.F
Q2
L.P.F
IC7
SYNC GENERATOR
VCXO
HLPF
VLPF
DLPF
HCMP
CMPO2
CMPP2
CMPN2
HRC
GND2
VDD2
LRC
CMPN1
CMPP1
CMPO1
LCMP
FVR
FVRP
SLPF
FSC4
VCO
DPCO
VPCO
HPCO
MVPC
VC1
COIN
CODUT
CLKOUT
GND3
VDD3
VC2
CXIN
CXOUT
TESTA
TESTB
TESTC
M1
M2
M3
SRC
SCMP
SPCO
SCP1
SCPO
SCR
SCB
SCOUT
SCIN
GND1
VDD1
BSD
GLBSC
CLR
MS
MCOUT
NP
VD2
GLVD
GLSYNC
CW
VDFD
LLDET
FVD
FWHD
FBLK
VD
CP2
BFP
GND4
RBLK
PWHD
WHD
CBLK
CSYNC
PS0
PS1
PS2
PS3
LP
L5 EXT VCO
TP3 (EXT VCO)
X2
(14.187MHz)
TP1 (WHD)
TP2 (VD)
Q50, IC12
SC PHASE CONTROL
Q1
L.P.F
IC11
X1
(17.734MHz)
TP7 (SC)
CF3(a)
L.P.F
CF3(b)
L.P.F
Q11
AMP
IC4
BUFFER
CARRIER BALANCE
MODULATOR
GAIN CONT
ADD
CHROMA/ BURST
ADD
HUE
MODULATOR
BURST AMP
MODULATOR
GAIN CONT
BUFFER
CARRIER BALANCE
BUFFER
FADE
MIX
VIDEO OUTPUT
PED L-CLIP
H-CLIP
COLOR MODULATOR/ENCODER
Q10
B.P.F
Q29, Q45
SYNC MIX
IC9
Q46-Q49
+5V
-8V REG
IC10
+9V
+5V
A
B
C
D
E
F
G
H
I
J
K
TO DIGITAL BOARD ...CN1
CN1
1 SDATA
2 SCLK
3 D/A-CS
4 LOW CLIP
5 RBLK
6 VD
7 FBLK
8 CP2
9 FWHD
10 FVD
11 B-DET
12 GROUND
13 R-DET
14 GROUND
15 LL-DET
16 GROUND
CN2
1 PS0
2 PS1
3 PS2
4 PS3
5 SPCO
6 SPC1
7 +5V-CONT
8 M1
9 M3
10 M2
11 NOT USED
12 ENC/+5V
13 YH
14 ENC/+5V
15 B-Y
16 R-Y
+5V
TO DIGITAL BOARD ...CN2
CN3
14 GROUND
13 VD2
12 2254 OUT
11 FVD
10 -8V
9 V-FINE
8 LL-PULSE
7 G/L IN
6 +9V
5 +9V
4 +5V-1
3 +5V-1
2 GROUND
1 GROUND
TO DRIVE BOARD ...CN3

CONDUCTOR VIEW OF DF

(VOLTAGES)

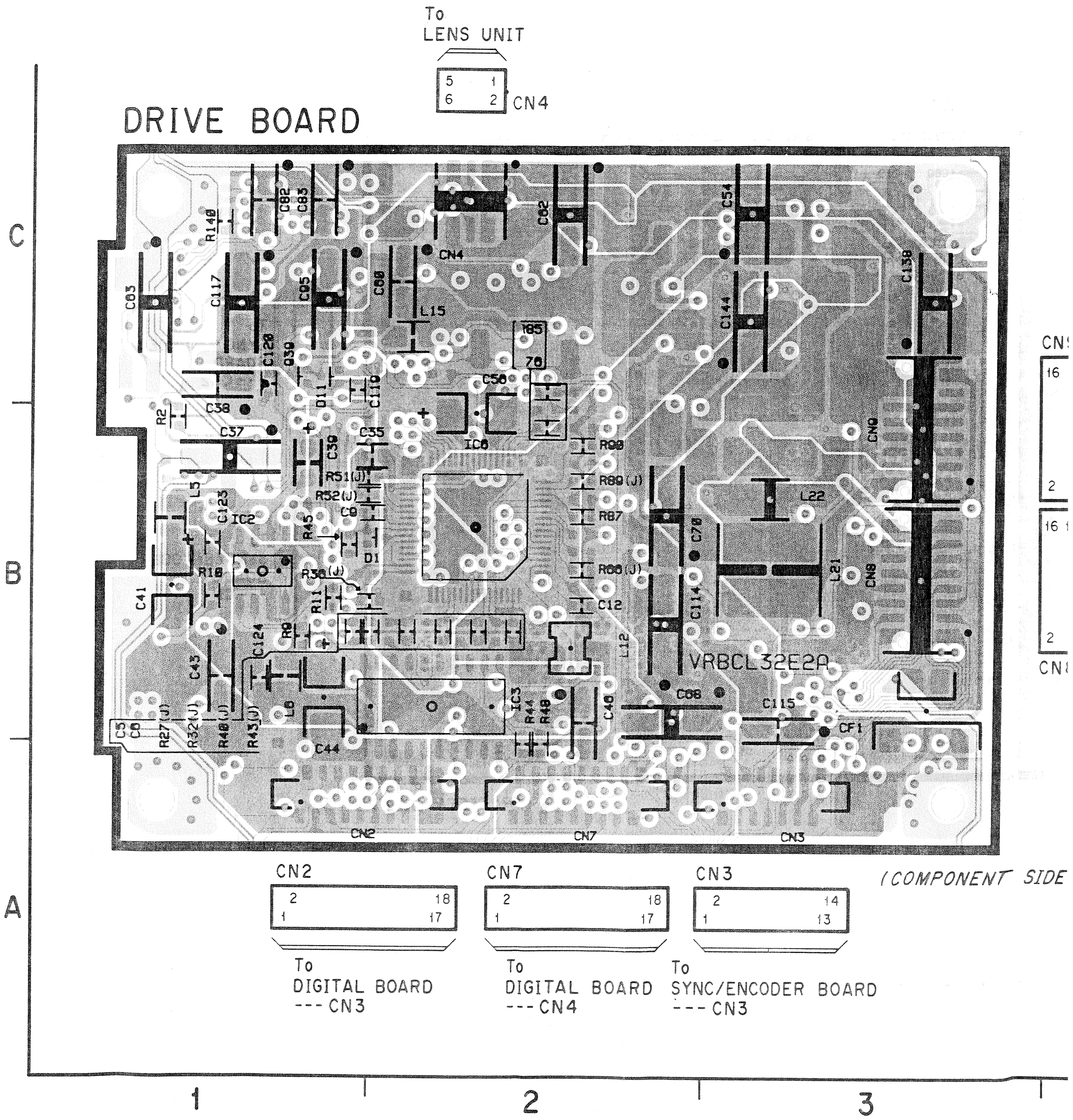
	IC1	IC2	IC3	IC4	IC5	IC7	IC8	IC9	IC10	IC20	IC21	IC22
Pin 1	2.9	4.8	0	0	9.4	-7.8	0	0	2.3	1.3	1.1	5.6
2	2.9	2.6	4.8	0.2	4.8	-7.5	4.4	4.5	2.3	1.3	1.1	0
3	0.5	2.6	0	0.3	4.8	0	4.5	4.5	2.3	0	0	5.0
4	2.9	4.8	4.8	0	0	-0.2			0	0.5	0.4	
5	5.4	1.2	0	4.8	1.9	4.8			2.3	4.8	4.8	
6		1.2	2.3	4.8	1.9	0.1			2.3			
7		0	0.4	5.0	4.2	4.8			4.1			
8		1.8	0.6	8.8	17.4	0			0			
9			0			0.1						
10			0			4.8						
11			2.0			4.6						
12			2.0			0						
13			0			14.6						
14			0			-7.4						
15			0			00.2						
16			0			0						
17			4.8									
18			4.8									
19			4.8									
20			4.8									

	IC6		IC6
Pin 1	0	Pin 33	4.7
2	2.0	34	4.8
3	0	35	1.8
4	0	36	2.4
5	0	37	0
6	4.8	38	0
7	0	39	1.5
8	0	40	0
9	0	41	1.1
10	0.7	42	8.5
11	0	43	0
12	0	44	0
13	0	45	1.1
14	0.5	46	1.4
15	0.1	47	0
16	0	48	4.8
17	0.4	49	0
18	0.1	50	0
19	2.4	51	0
20	2.4	52	0
21	0	53	0
22	4.8	54	4.8
23	0.1	55	0
24	0	56	0
25	4.8	57	0
26	0	58	0
27	4.8	59	0
28	4.6	60	0
29	4.6	61	0
30	0.1	62	0
31	4.8	63	0
32	4.8	64	0

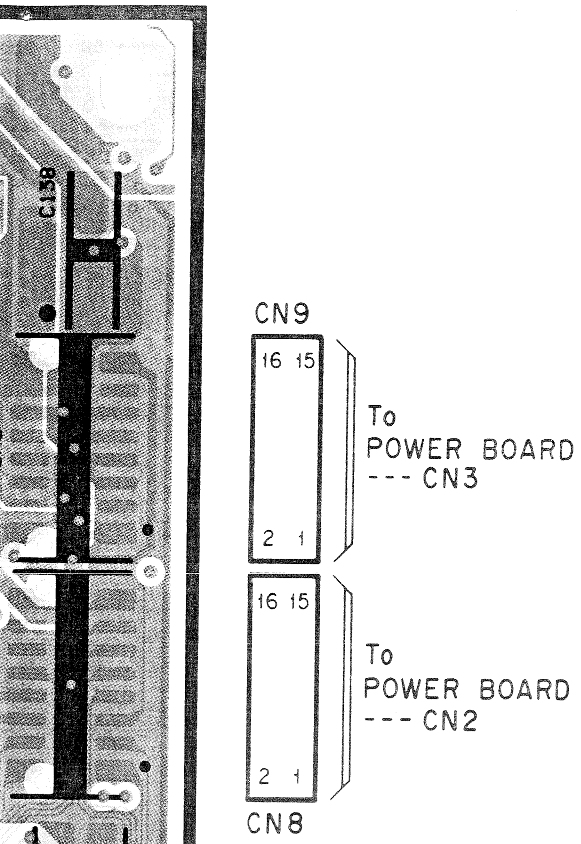
	B	C	E
Q1	3.0	6.9	2.2
2	8.6	8.7	7.9
3	1.7	8.7	1.4
4	1.7	5.4	1.05
6	2.3	2.0	4.8
7	4.3	4.5	5.0
8	6.7	10.0	6.2
9	10.0	9.1	10.1
10	15.2	16.6	14.6

	B	C	E
12	15.2	16.6	14.6
13	0.1	7.1	0
17	3.6	4.3	4.4
18	8.0	8.7	8.7
19	2.8	7.1	2.2
20	2.0	2.2	1.4
21	2.2	8.7	2.2
22	3.0	4.8	2.3
23	2.4	0	3.0

	B	C	E
24	5.4	8.7	4.7
33	6.7	2.2	7.3
34	6.7	2.2	7.3
35	1.6	0	2.2
36	1.6	0	2.2
37	4.9	5.0	5.6
38	0	12.7	0
39	23.4	-	24.0

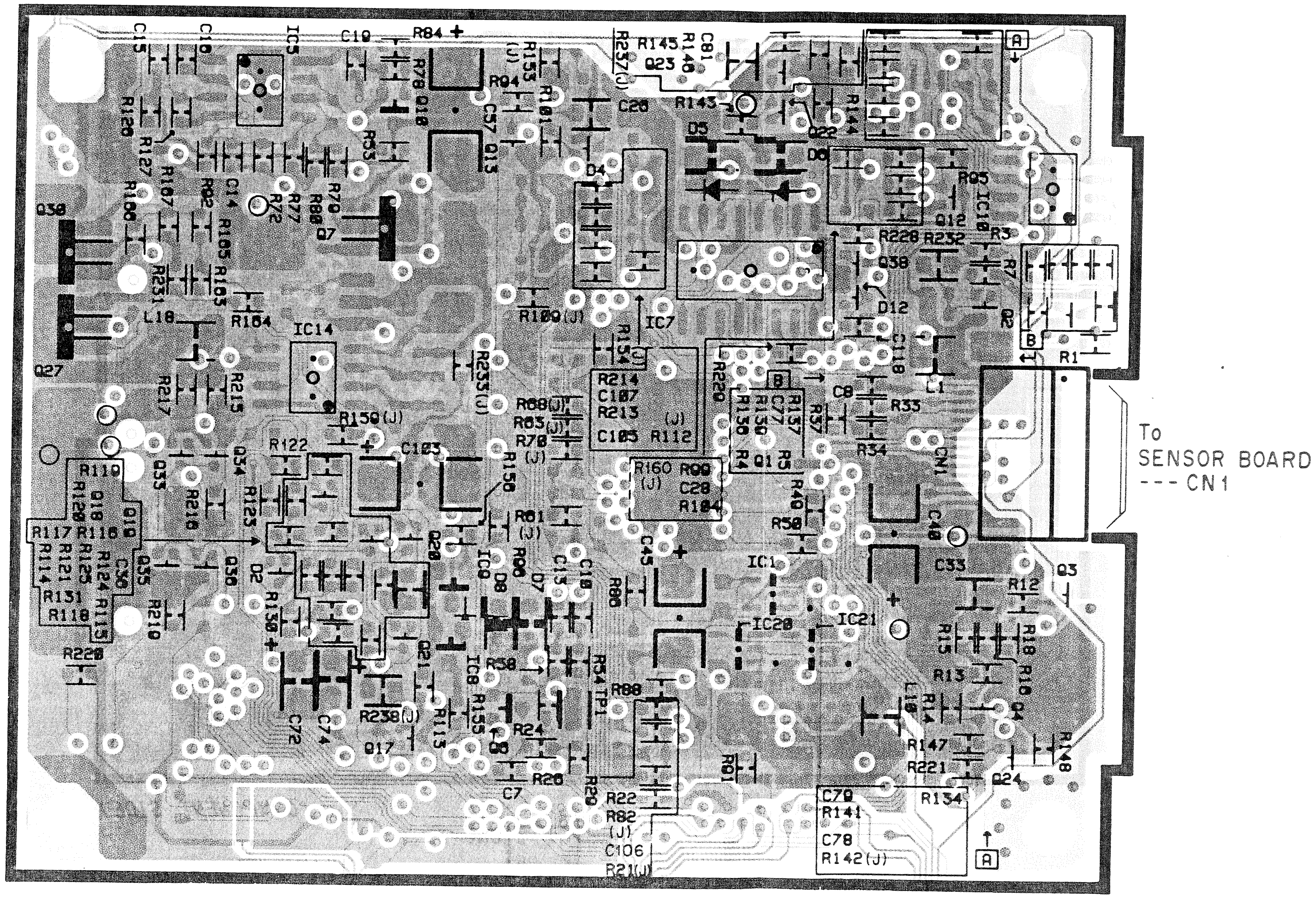

To
LENS UNIT
CN4
DRIVE BOARD
C
B
A
1
2
3
IC6
IC2
IC3
VRBCL32E2A
CN2
CN7
CN3
(COMPONENT SIDE
To
DIGITAL BOARD
--- CN3
To
DIGITAL BOARD
--- CN4
To
SYNC/ENCODER BOARD
--- CN3

OR VIEW OF DRIVE BOARD


C130
CN9
16 15
2 1
To
POWER BOARD
--- CN3
16 15
2 1
To
POWER BOARD
--- CN2
CN8

(COMPONENT SIDE)

DRIVE BOARD


C15
C16
IC5
C19
R84
R153
R94
R237(J)
R145
Q23
C81
R143
C20
D5
D6
R144
Q22
A
R120
R127
R107
R106
R92
C14
R77
R72
R70
R80
Q7
R78
Q10
R53
C57
Q13
R101
D4
R95
Q12
IC10
R3
R228
R232
Q39
Q30
R231
R183
R105
L18
R104
IC14
R109(J)
IC7
R154
D12
R7
R2
B
R1
C110
C1
Q27
R217
R215
R150(J)
R233(J)
R68(J)
R63(J)
R79
R214
C107
R213
C105
R112
R220
R130
C77
R157
C8
R33
R34
Q1
R5
R4
R40
R50
R119
Q18
Q19
R120
R117
R116
R121
R114
R131
R118
Q33
Q35
R210
Q34
R122
R123
C103
R156
R61
R160
R90
C28
R104
C45
C40
CN1
To
SENSOR BOARD
--- CN1
Q20
IC8
D8
D7
R90
C13
C18
R80
IC1
IC20
IC21
C33
R12
Q3
D2
R150
Q36
R220
R15
R18
R16
R13
Q21
IC6
R58
R54
TP1
R88
L10
R14
Q4
C72
C74
R238(J)
R113
R155
R24
R26
R29
R22
R82(J)
C106
R21(J)
R91
C79
R141
C78
R142(J)
R134
R147
R221
Q24
R148
Q17
C7

(PATTERN SIDE)

〈Index〉
DRIVE BOARD

IC1	B6
IC2	B1
IC3	B2
IC5	C5
IC6	B2
IC7	C6
IC8	B5
IC9	B5
IC10	C7
IC14	B5
IC20	B6
IC21	B6
Q1	B6,C7
Q2	C7
Q3	B7
Q4	B7
Q6	B7
Q7	C5
Q10	C5
Q12	C6
Q13	C5
Q17	A5
Q18	B4,B5
Q19	B5
Q20	B5
Q21	A5
Q22	C6
Q23	C6
Q24	A7
Q27	B4,C4
Q30	C4
Q33	B5
Q34	B5
Q35	B5
Q36	B5
Q38	C6
Q39	C1
D1	B2
D2	B5
D4	C6
D5	C6
D7	B5
D8	B5
D11	C1
D12	C6

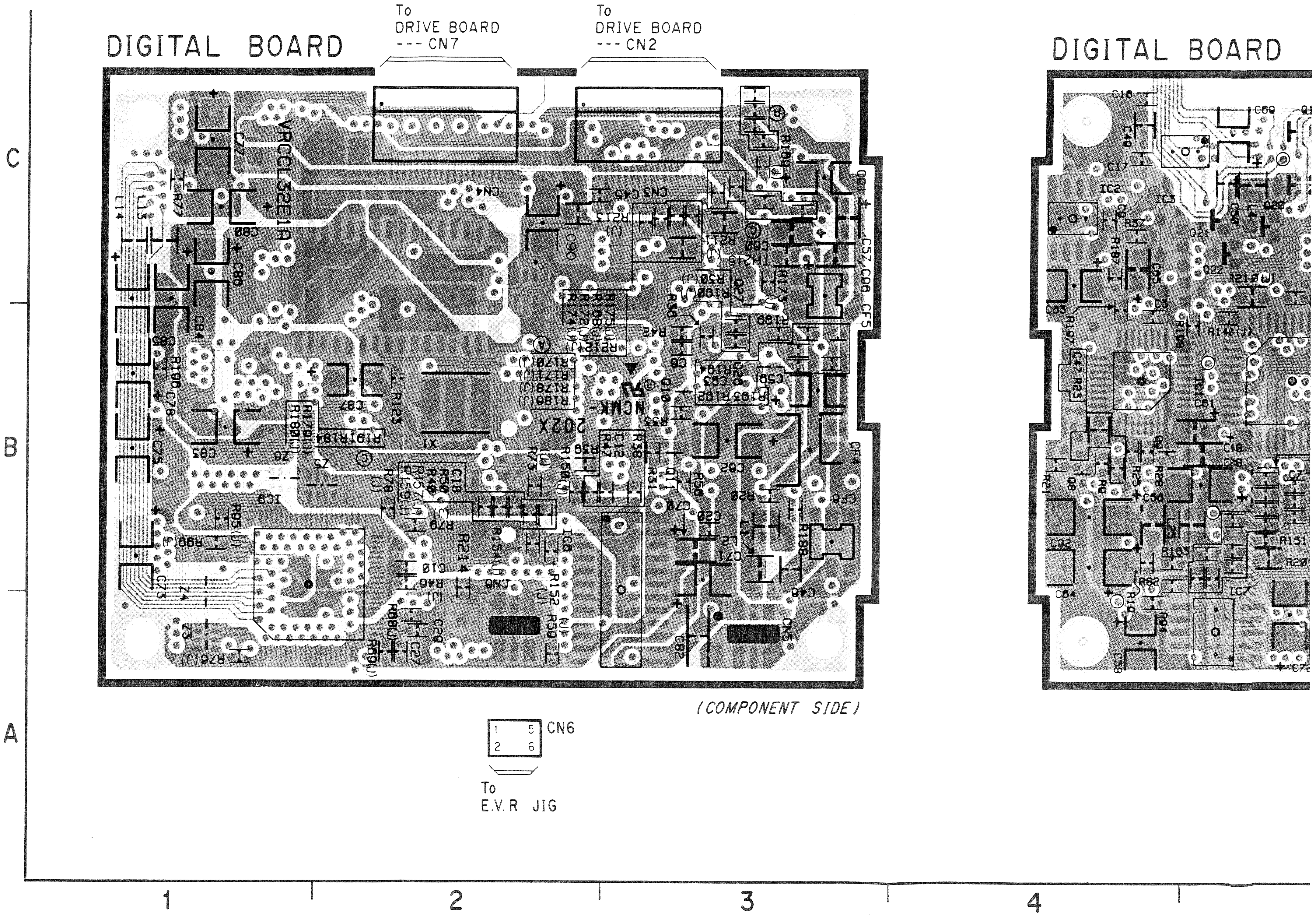
4 5 6 7

CONDUCTOR VIEW OF DI

<Index>

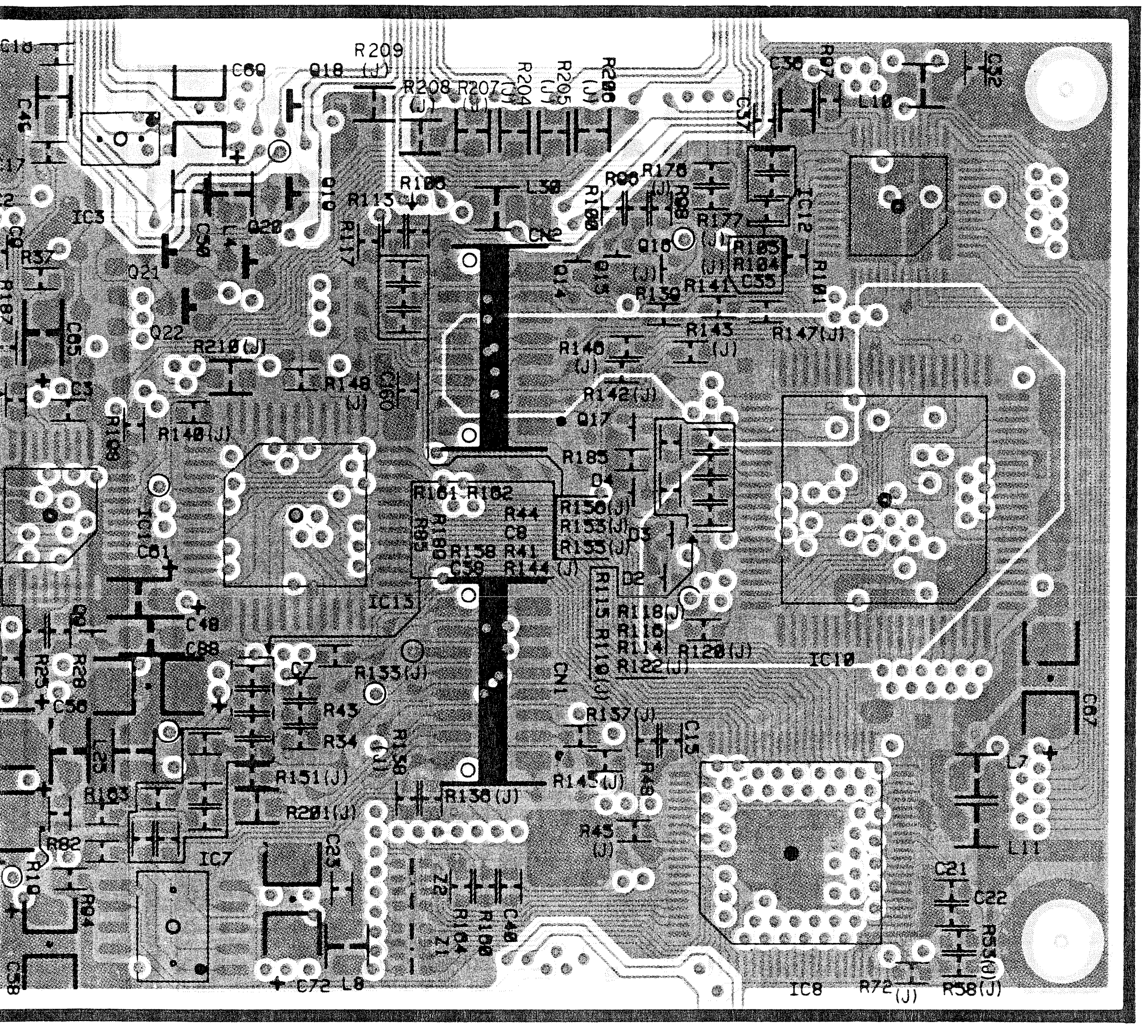
DIGITAL BOARD

IC1	B5
IC2	B4
IC3	C4
IC6	A2
IC7	A5
IC8	A6
IC9	A1
IC10	B6
IC12	B6
IC13	B5
Q8	B4
Q9	B5
Q10	B3
Q11	B3
Q14	B5
Q15	B6
Q16	B6
Q17	B6
Q18	C5
Q19	B5
Q20	B5
Q26	B3
Q27	B3
D2	B6
D3	B6
D4	B6

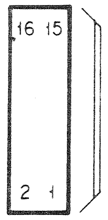

DIGITAL BOARD
To
DRIVE BOARD
--- CN7
To
DRIVE BOARD
--- CN2
C
B
A
(COMPONENT SIDE)
1
5
2
6
CN6
To
E.V.R JIG
1
2
3
4
DIGITAL BOARD

TOR VIEW OF DIGITAL BOARD

TAL BOARD

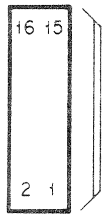

C60
Q18
R209
(J)
R208
R207
R204
R205
R200
C36
C37
L10
C32
IC5
R37
Q21
Q22
C50
Q20
R113
R117
R188
L30
CN2
R176
R177
IC12
R181
Q16
R139
R141
R105
R104
C55
R210(J)
R148
R140(J)
R146
R143
R147(J)
R142(J)
Q17
R185
D4
R161
R162
R44
C8
C39
R158
R41
R144
R130(J)
R153(J)
R155(J)
D3
D2
IC13
C48
C88
C61
R43
R34
R133(J)
R118(J)
R116
R114
R122(J)
R120(J)
IC10
CN1
R137(J)
R145(J)
R48
R45
R151(J)
R201(J)
R136(J)
R138(J)
C67
L7
L11
C21
C22
IC7
C72
L8
R100
C40
IC8
R72
R58(J)
R56(J)

(PATTERN SIDE)



To
SYNC/ENCODER
BOARD
--- CN2

CN2



To
SYNC/ENCODER
BOARD
--- CN1

CN1

5 6

(VOLTAGES)

	IC8	IC9	IC10
Pin 1	0.3	2.1	2.4
2	0.8	0	2.4
3	2.8	0	2.4
4	1.0	1.8	2.4
5	0.9	1.5	2.4
6	0.8	1.5	2.8
7	1.2	0	2.7
8	1.5	2.5	3.8
9	1.2	3.4	2.4
10	0.2	0	3.6
11	1.2	0.2	3.1
12	2.1	1.2	3.1
13	1.8	1.4	3.0
14	1.3	1.1	2.8
15	1.4	1.2	0.0
16	1.4	1.8	4.3
17	1.8	2.1	3.9
18	0	3.0	4.1
19	0	0	3.4
20	2.1	0.3	1.1
21	0	0.1	3.1
22	4.3	0.5	3.1
23	0.4	2.1	4.3
24	2.4	0	0.0
25	1.3	0.8	0.1
26	1.5	1.0	4.8
27	1.7	0	2.1
28	1.6	0	4.3
29	1.5	4.3	1.7
30	1.5	0	1.9
31	1.6	0	0.0
32	0.4	0	0.0
33	0	4.3	0
34	0	4.3	0
35	0	4.1	4.3
36	0	4.2	0
37	0	4.2	4.3
38	0	4.2	4.3
39	0	0.4	4.3
40	0	0	0

	IC8	IC9	IC10
Pin 41	4.3	0	0
42	3.7	4.2	0
43	3.0	4.0	4.2
44	3.1	2.8	4.3
45	3.0	2.8	4.3
46	2.7	2.8	4.3
47	0.5	1.6	0
48	0.6	0.6	0
49	0.7	1.0	4.3
50	0.8	1.0	0
51	1.0	0.1	0
52	1.1	0.4	4.3
53	0.9	0.2	4.3
54	1.8	0.4	0
55	2.4	2.7	3.2
56	2.8	2.9	0
57	2.4	3.2	0
58	4.1	3.3	1.6
59	0.5	3.8	1.6
60	0	2.8	2.3
61	0.6	0	1.7
62	0	0	2.7
63	4.2	0	0
64	4.2	0	0
65	4.1	0	0
66	4.1	0	0
67	4.3	4.3	3.7
68	4.3	0.5	4.3
69	4.3	0	4.3
70	0	0	0.5
71	4.3	4.3	0.7
72	0	2.1	0.8
73	1.8	1.2	0.9
74	1.5	1.3	1.0
75	2.2	1.4	1.2
76	1.5	1.5	1.0
77	1.6	1.5	1.8
78	1.8	1.5	0
79	0	0	2.4
80	0	1.4	2.3

	IC2	IC3	IC7
Pin 1	1.7	2.2	4.2
2	1.7	2.2	0
3	1.7	2.2	0
4	0	0	4.3
5	1.7	3.1	4.3
6	1.7	3.1	0
7	1.7	3.1	0
8	4.8	4.8	0
9			4.3
10			4.3

	B	C	E
Q8	1.9	8.7	1.36
9	0.5	0	1.1
10	1.9	0	2.5
11	2.5	4.8	1.8
14	4.2	4.8	3.6
15	4.5	4.7	3.9
16	4.2	4.8	0
17	0	4.4	0
18	0	4.3	0
19	0	4.3	3.8
20	0	4.3	2.4
26	1.7	0	2.3
27	0	3.1	1.6

	IC1	IC6	IC12	IC13
Pin 1	1.9	0	1.4	0
2	4.8	0	0	0
3	0	0	0	4.1
4	4.8	1.6	1.4	0
5	2.1	1.6	2.1	2.1
6	0	1.7	0	2.0
7	0	2.2	0	4.2
8	8.7	1.9	4.8	3.7
9	3.1	0	1.3	0.5
10	4.8	0	1.3	0.1
11	2.0	4.3	1.3	4.1
12	0	2.1	1.3	0
13	2.5	4.3	1.3	0
14	1.7	4.3	0	0
15	0	4.3	1.9	0
16	1.9	4.3	0	0
17	3.7	3.7	0	4.3
18	1.6	4.3	0	0
19	1.9	1.8	0.7	2.8
20	8.7	0	0	3.0
21	0.9	0	2.7	3.1
22	0	0	2.6	3.0
23	0	1.6	2.8	2.4
24	4.8	0	1.5	2.4
25	1.9		3.8	2.4
26	4.8		0	1.8
27	1.9		4.2	1.0
28	0		0	1.1
29	0		4.2	1.0
30	4.8		0	0.8
31	1.9		0	0.8
32	0		0	0.5
33			0	0.5
34			0	0
35			0	4.3
36			0	0.5
37			0	0.1
38			0	0
39			0	0
40			0	4.3
41			0	4.3
42			0	4.3
43			0	0
44			4.8	4.3
45			0	
46			1.6	
47			1.8	
48			2.0	

(VOLTAGES)

	IC4		IC4
Pin 1	1.7	Pin 25	0
2	4.8	26	0
3	2.6	27	1.7
4	1.7	28	2.0
5	4.8	29	2.1
6	0	30	1.2
7	4.7	31	1.9
8	0	32	1.7
9	0	33	1.7
10	1.7	34	0
11	0	35	2.9
12	0	36	4.8
13	0	37	2.9
14	0	38	2.4
15	1.7	39	1.7
16	1.7	40	1.7
17	4.8	41	2.9
18	3.3	42	4.8
19	1.7	43	0
20	2.6	44	0.35
21	1.7	45	2.3
22	0	46	0
23	0	47	2.4
24	0	48	1.1

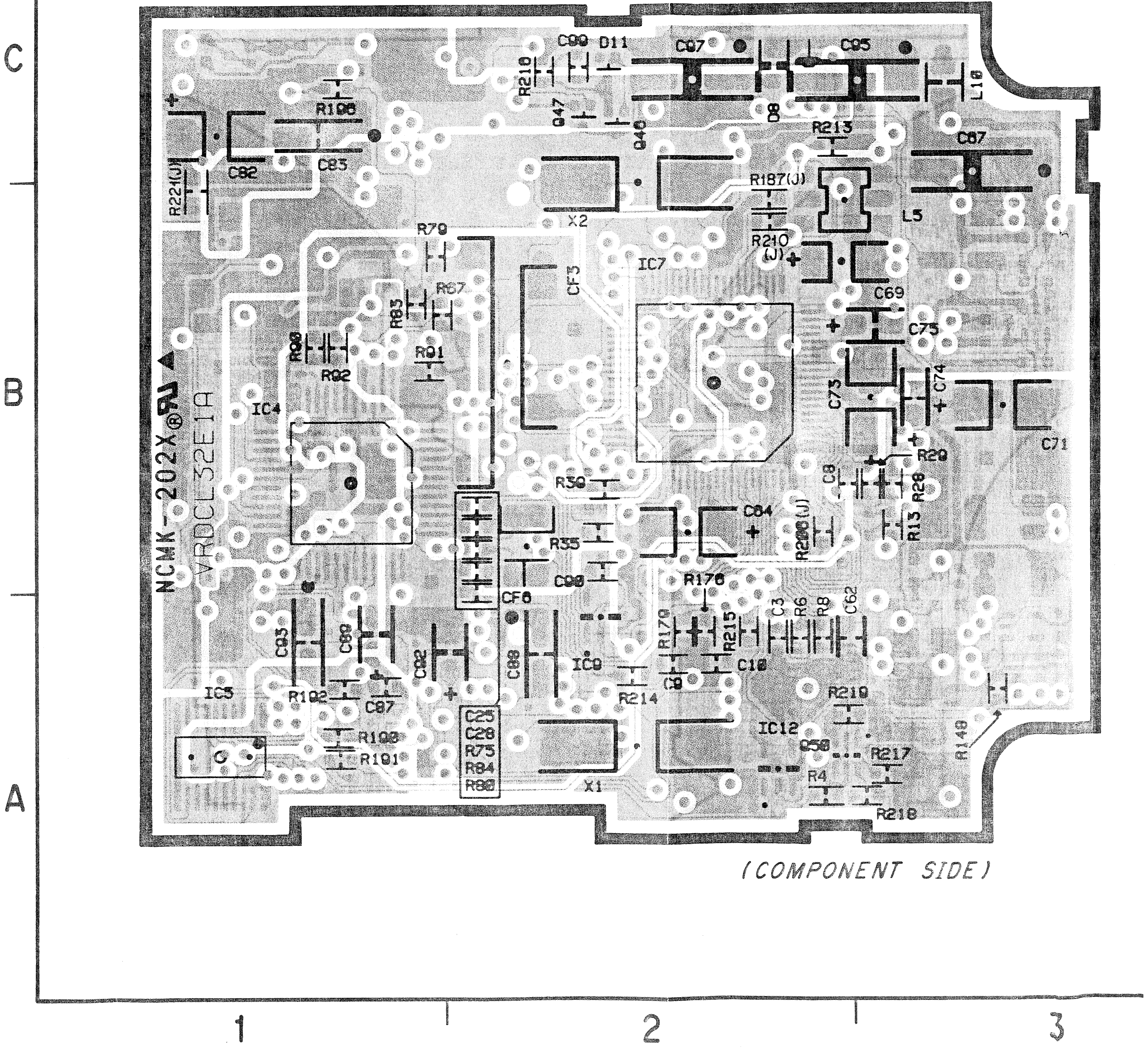
	B	C	E
Q2	4.7	4.8	4.8
7	0.3	0	4.8
10	1.7	0	2.3
11	0	0	2.5
29	0	8.7	1.2
46	0.8	1.7	0.3
47	9.2	1.7	8.7
48	4.1	0	2.3
49	0	4.1	0

	IC7		IC7		IC7		IC7
Pin 1	0	Pin 21	0	Pin 41	0	Pin 61	0.1
2	0.5	22	0	42	4.8	62	4.8
3	0	23	0	43	0.1	63	4.7
4	1.5	24	0	44	0.1	64	0
5	4.8	25	4.8	45	0.7	65	0
6	4.8	26	0	46	1.2	66	4.8
7	0.9	27	0	47	0.1	67	4.8
8	0	28	4.8	48	0.1	68	0
9	0	29	0	49	0.1	69	4.8
10	4.8	30	0	50	0	70	4.8
11	0	31	4.8	51	1.0	71	0
12	0	32	0	52	0.7	72	2.4
13	0	33	0	53	0.7	73	2.5
14	2.3	34	4.8	54	1.1	74	1.3
15	4.8	35	0	55	4.4	75	1.3
16	4.8	36	0	56	4.3	76	0
17	0	37	0	57	4.3	77	4.3
18	0.3	38	0	58	4.3	78	0
19	4.7	39	0.0	59	4.7	79	4.8
20	0	40	0	60	4.8	80	0

	Pin 1	2	3	4	5	6
Q37	1.6	2.3	8.7	4.4	5.1	5.1
38	0	0.6	8.7	3.8	4.4	0.1
45	1.1	1.7	8.7	0	3.1	3.1

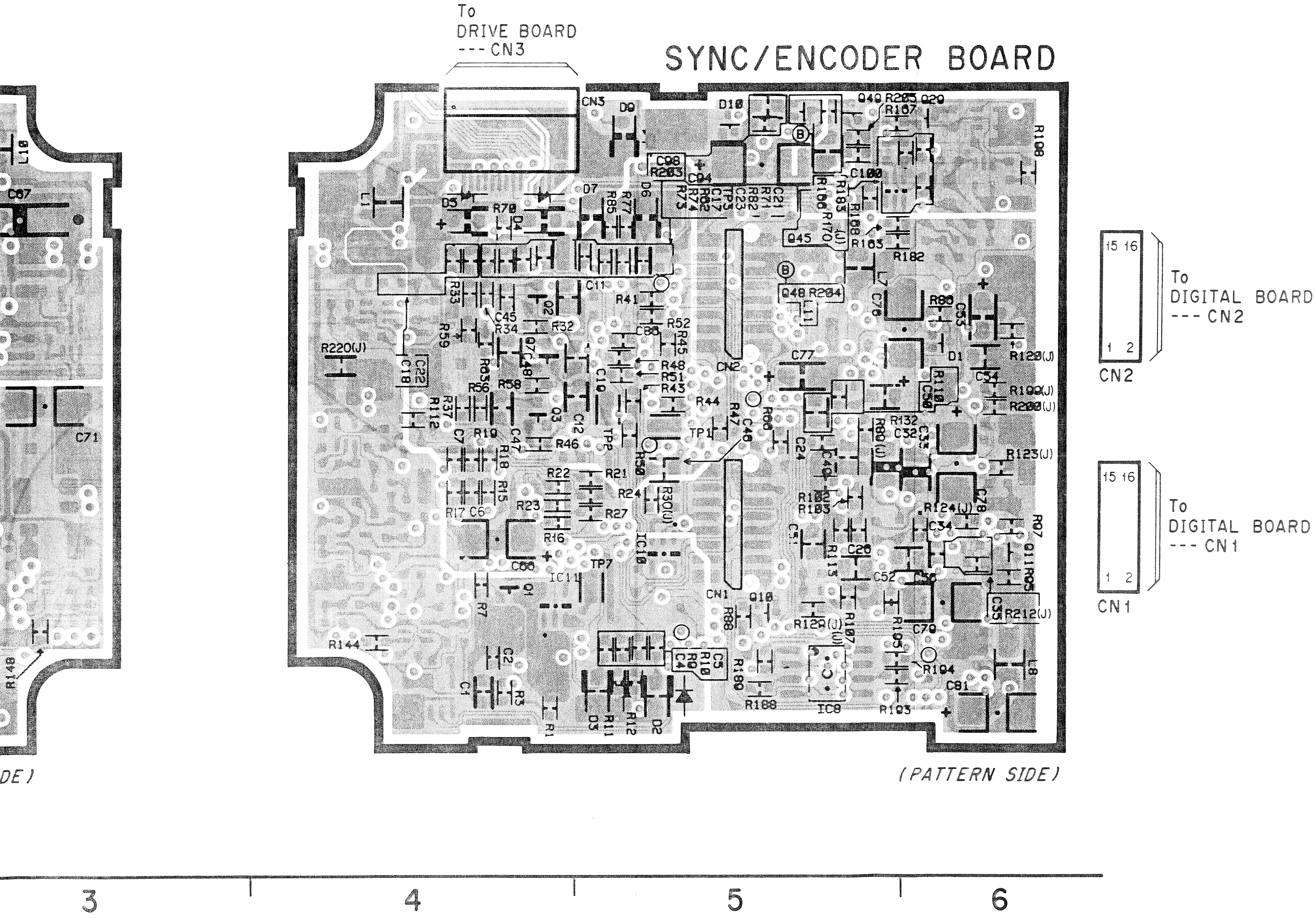
	IC5	IC8	IC9	IC10	IC11	IC12
Pin 1	0	0.1	4.4	0	0	0
2	0.9	1.7	4.4	0	0	0
3	1.4	1.7	0	0	0	0.6
4	1.7	0	4.3	4.8	5.0	2.9
5	1.7	0	4.8	4.8	0	5.5
6	2.2	1.7				
7	0.6	0.1				
8	0	4.8				
9	0					
10	3.8					
11	4.8					
12	1.6					
13	0.9					
14	1.8					
15	0					
16	3.3					
17	4.3					
18	2.4					
19	0					
20	0					

SYNC/ENCODER BOARD


C
B
A
1
2
3
NCMK-202X
VRDCL32E1A
IC4
IC5
IC7
IC9
IC12
X1
X2
CF3
CF6
L5
L10
D8
D11
Q47
Q40
R221(J)
R210
R196
R213
R187(J)
R210 (J)
R79
R87
R85
R91
R92
R98
R30
R35
R20
R28
R13
R208(J)
R176
R170
R215
R6
R8
R102
R100
R101
R214
R219
R217
R218
R4
R148
C90
C97
C95
C87
C82
C83
C69
C75
C73
C74
C71
C8
C64
C98
C3
C62
C10
C9
C93
C89
C92
C88
C87
C58
C25
C28
R75
R84
R88

(COMPONENT SIDE)

R VIEW OF SYNC/ENCODER BOARD


To
DRIVE BOARD
--- CN3
SYNC/ENCODER BOARD
CN3
15 16
1 2
To
DIGITAL BOARD
--- CN2
CN2
15 16
1 2
To
DIGITAL BOARD
--- CN1
CN1
(PATTERN SIDE)
DE)
3
4
5
6

〈Index〉
SYNC/ENCODER
BOARD

IC4	B1
IC5	A1
IC7	B2
IC8	A5
IC9	A2
IC10	B5,A5
IC11	A4
IC12	A2
Q7	B4
Q10	A5
Q11	A6
Q29	C6
Q45	B5,C5
Q46	C2
Q47	C2
Q48	C5,B5
Q49	C5
Q50	A2
D1	B6
D2	A5
D3	A5
D4	C4
D5	C4
D8	C2
D9	C5
D10	C5
D11	C2

CONTROL BOARD

	IC1	IC2	IC3	IC4	IC5	IC6	IC7	IC8	IC9	IC10	IC11	IC100	IC101	IC102	IC103
Pin 1	16	5.0	0	0	5.0	0	5.0	5.0	0	0	9.8	5.0	5.0	5.0	5.0
2	0	0	1.4	0.1	0	5.0	0	0	5.0	0	5.0	0	0	0	0
3	1.5	8.0	0	0	0	5.0	0	0	0	9.9	0.5	5.0	5.0	5.0	5.0
4			0	5.0	0	0	5.0	5.0	0	4.3	0				
5			1.2	0	0	5.0	0	5.0	5.0	2.4	0				
6			5.0	0	0	5.0	5.0	0		4.4	0				
7			5.0	0	0	0	0	0		2.4	0.5				
8			0	0	0	5.0	5.0	0		4.3	5.0				
9				0	0	5.0	0	5.0		2.4	0.7				
10				0	5.0	0	5.0	5.0		4.2	9.8				
11				0	0	5.0	0	0		0	5.0				
12				0	0	0	5.0	5.0		0	0.5				
13				0	0	5.0	0	0		0	0				
14				0	5.0	5.0	5.0	5.0		0	0				
15				5.0							0				
16				0							0.5				
17				0							5.0				
18				0							1.0				
19				0											
20				0											
21				0											
22				5.0											
23				5.0											
24				0											

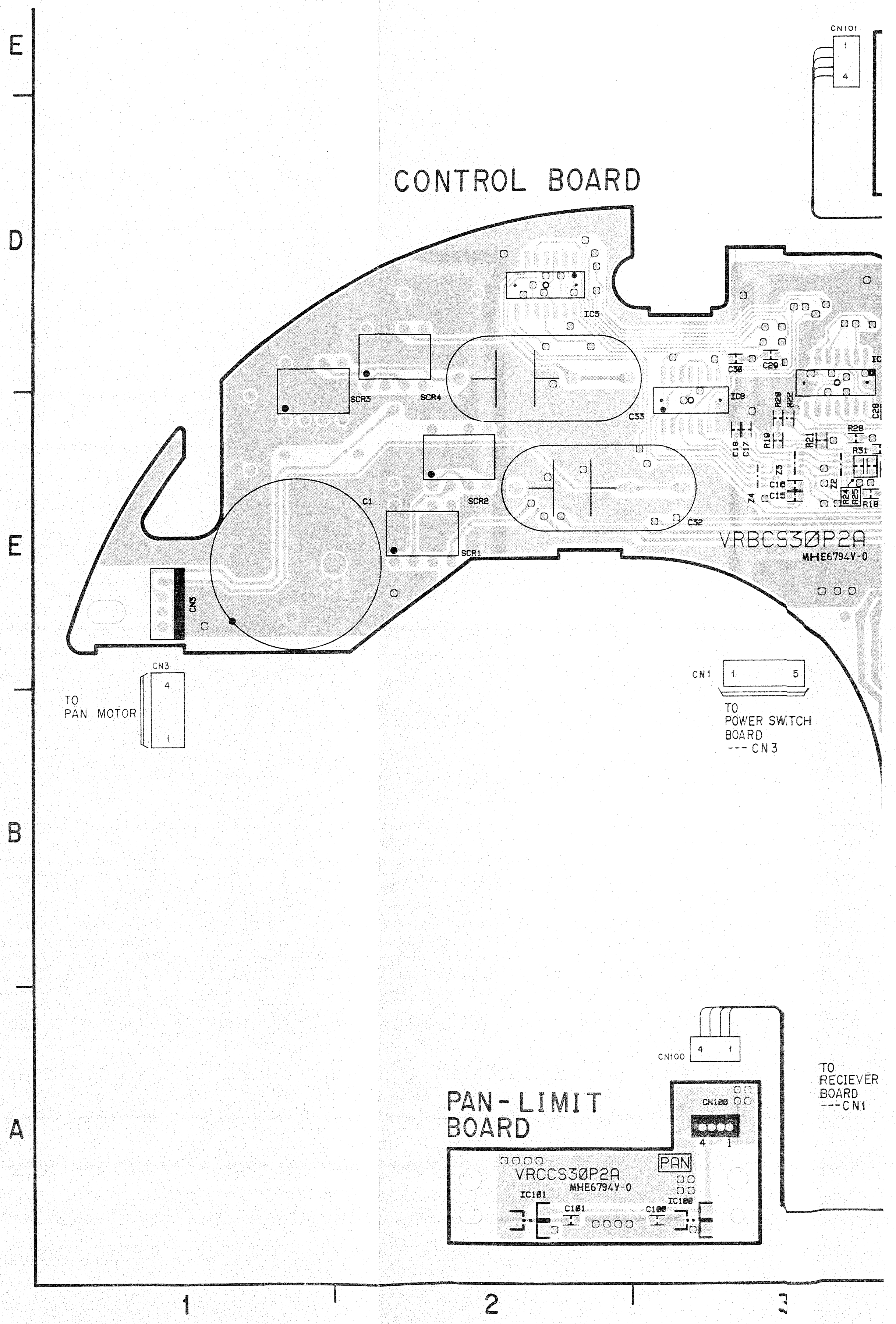
	B	C	E
Q1	0	9.2	0
2	0	9.1	0
3	0	9.2	0
4	0	9.2	0
5	5.0	2.5	5.0
6	0	2.5	0

⟨Index⟩

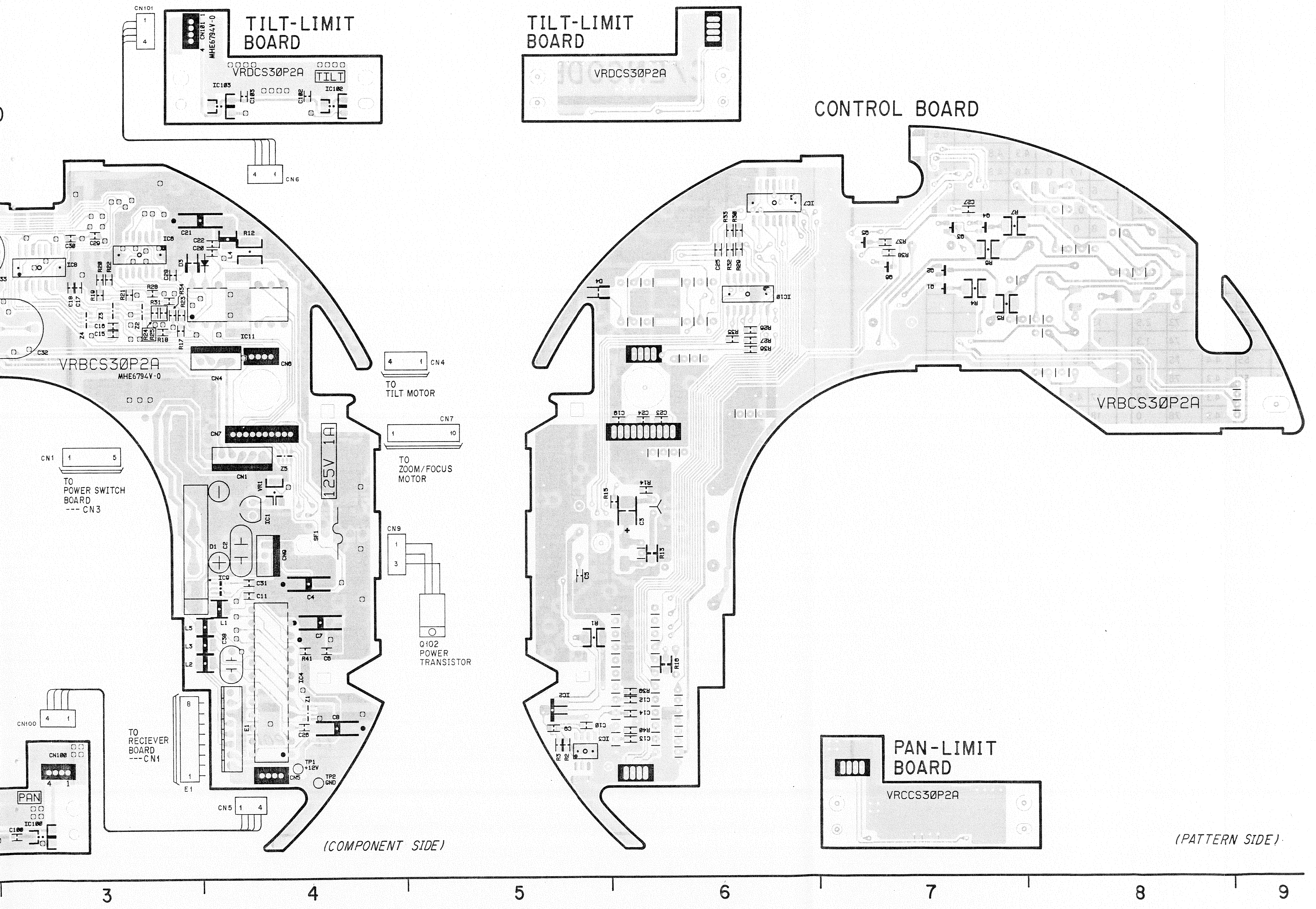
CONTROL BOARD

IC1	B4
IC2	A5
IC3	A5
IC4	A4
IC5	D2
IC6	D3
IC7	D6
IC10	C6
IC8	C3
IC9	B4
IC11	C3
IC100	A3
IC101	A2
IC102	D4
IC103	D4
Q1	C7
Q2	C7
Q3	D7
Q4	D7
Q5	D7
Q6	C7
D1	B3
D3	C3
D4	C5

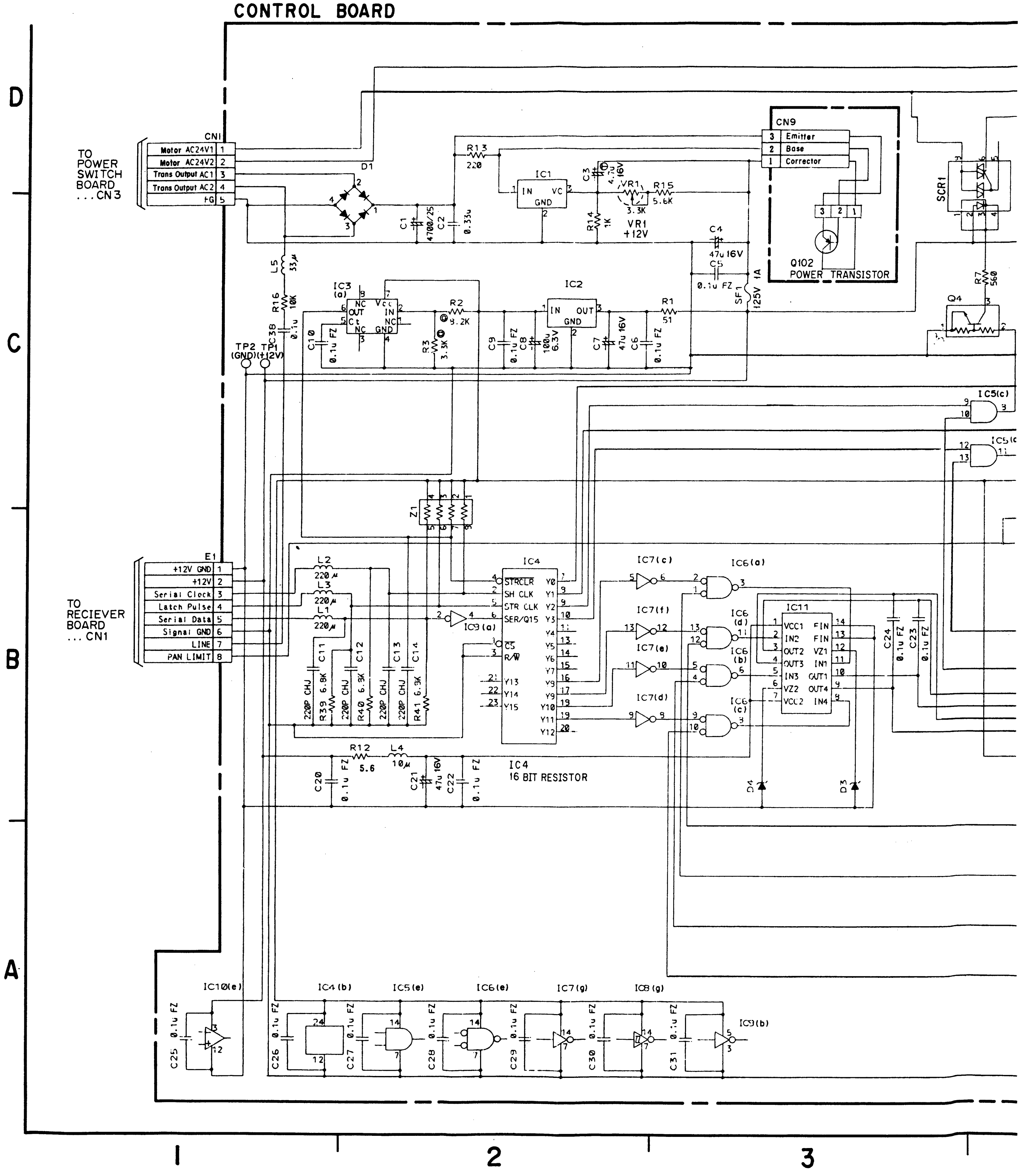
CONDUCTOR VIEW OF CO


E
D
E
B
A
1
2
3
CN101
1
4
CONTROL BOARD
IC5
SCR3
SCR4
C30
C29
IC8
C33
R20
R22
R19
R21
R28
R31
C18
C17
Z3
Z2
Z4
C16
C15
R24
R25
R18
C1
SCR2
C32
SCR1
CN3
VRBCS30P2A
MHE6794V-0
CN3
4
1
TO
PAN MOTOR
CN1
1
5
TO
POWER SWITCH
BOARD
--- CN3
CN100
4
1
TO
RECIEVER
BOARD
---CN1
PAN-LIMIT
BOARD
CN100
VRCCS30P2A
PAN
MHE6794V-0
IC101
C101
C100
IC100

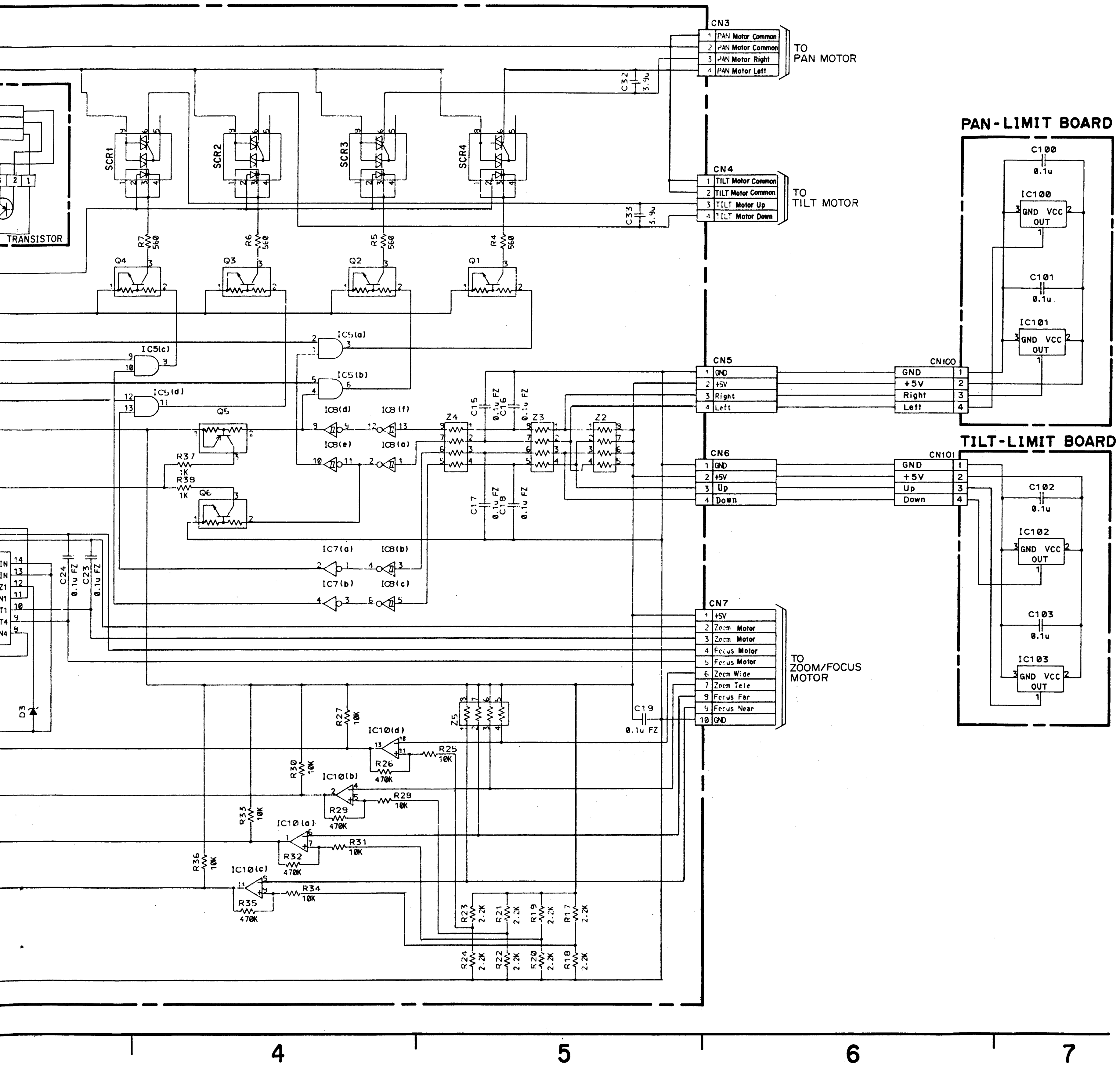
OR VIEW OF CONTROL BOARD


TILT-LIMIT BOARD
VRDCS30P2A
TILT
CN101
MHE6794V-0
IC103
IC102
CN6
TILT-LIMIT BOARD
VRDCS30P2A
CONTROL BOARD
VRBCS30P2A
MHE6794V-0
CN4
TO TILT MOTOR
CN7
TO ZOOM/FOCUS MOTOR
CN1
TO POWER SWITCH BOARD
---CN3
CN9
Q102 POWER TRANSISTOR
125V 1A
CN100
TO RECIEVER BOARD
---CN1
TP1 +12V
TP2 GND
CN5
PAN
IC100
E1
IC1
IC4
IC6
IC8
IC9
IC11
(COMPONENT SIDE)
VRBCS30P2A
IC7
IC10
IC2
IC3
PAN-LIMIT BOARD
VRCCS30P2A
(PATTERN SIDE)
3
4
5
6
7
8
9

SCHEMATIC DIAGRAM OF CO


CONTROL BOARD
D
C
B
A
1
2
3
TO POWER SWITCH BOARD ...CN3
CN1
Motor AC24V1 1
Motor AC24V2 2
Trans Output AC1 3
Trans Output AC2 4
FG 5
TO RECIEVER BOARD ...CN1
E1
+12V GND 1
+12V 2
Serial Clock 3
Latch Pulse 4
Serial Data 5
Signal GND 6
LINE 7
PAN LIMIT 8
D1
C1 4700/25
C2 0.33u
R13 220
IC1 IN VC GND
C3 4.7u 16V
VR1 3.3K
R15 5.6K
R14 1K
VR1 +12V
C4 47u 16V
C5 0.1u FZ
SF1 125V 1A
CN9
3 Emitter
2 Base
1 Corrector
Q102 POWER TRANSISTOR
SCR1
R7 560
Q4
L5 33µ
R16 10K
C38 0.1u
TP2 (GND)
TP1 (12V)
IC3 (a)
C10 0.1u FZ
R2 8.2K
R3 3.3K
IC2 IN OUT GND
C9 0.1u FZ
C8 100u 6.3V
C7 47u 16V
C6 0.1u FZ
R1 51
IC5(c)
IC5(d)
Z1
L2 220µ
L3 220µ
L1 220µ
C11 220P CHJ
R39 6.8K
C12 220P CHJ
R40 6.8K
C13 220P CHJ
C14 220P CHJ
R41 6.8K
IC4
STRCLR SH CLK STR CLK SER/Q15 CS R/W
Y0 Y1 Y2 Y3 Y4 Y5 Y6 Y7 Y8 Y9 Y10 Y11 Y12 Y13 Y14 Y15
IC9(a)
IC7(c)
IC7(f)
IC7(e)
IC7(d)
IC6(a)
IC6(d)
IC6(b)
IC6(c)
IC11
VCC1 IN2 OUT2 OUT3 IN3 VZ2 VCC2 FIN FIN VZ1 IN1 OUT1 OUT4 IN4
C24 0.1u FZ
C23 0.1u FZ
D4
D3
R12 5.6
L4 10µ
C20 0.1u FZ
C21 47u 16V
C22 0.1u FZ
IC4 16 BIT RESISTOR
IC10(e)
IC4(b)
IC5(e)
IC6(e)
IC7(g)
IC8(g)
IC9(b)
C25 0.1u FZ
C26 0.1u FZ
C27 0.1u FZ
C28 0.1u FZ
C29 0.1u FZ
C30 0.1u FZ
C31 0.1u FZ

AGRAM OF CONTROL BOARD



CN3
PAN Motor Common
PAN Motor Common
PAN Motor Right
PAN Motor Left
TO PAN MOTOR
C32 3.9u
CN4
TILT Motor Common
TILT Motor Common
TILT Motor Up
TILT Motor Down
TO TILT MOTOR
C33 3.9u
SCR1
SCR2
SCR3
SCR4
TRANSISTOR
R7 560
R6 560
R5 560
R4 560
Q4
Q3
Q2
Q1
IC5(a)
IC5(b)
IC5(c)
IC5(d)
Q5
Q6
R37 1K
R38 1K
IC8(d)
IC8(e)
IC8(f)
IC8(a)
IC8(b)
IC8(c)
IC7(a)
IC7(b)
Z4
Z3
Z2
Z5
C15
C16 0.1u FZ
C17
C18 0.1u FZ
C24 0.1u FZ
C23 0.1u FZ
D3
CN5
GND
+5V
Right
Left
CN6
GND
+5V
Up
Down
CN7
+5V
Zoom Motor
Zoom Motor
Focus Motor
Focus Motor
Zoom Wide
Zoom Tele
Focus Far
Focus Near
GND
TO ZOOM/FOCUS MOTOR
C19 0.1u FZ
R27 10K
R30 10K
R33 10K
R36 10K
IC10(d)
IC10(b)
IC10(a)
IC10(c)
R25 10K
R26 470K
R28 10K
R29 470K
R31 10K
R32 470K
R34 10K
R35 470K
R23 2.2K
R21 2.2K
R19 2.2K
R17 2.2K
R24 2.2K
R22 2.2K
R20 2.2K
R18 2.2K
PAN-LIMIT BOARD
C100 0.1u
IC100
GND VCC OUT
C101 0.1u
IC101
CN100
GND
+5V
Right
Left
TILT-LIMIT BOARD
CN101
GND
+5V
Up
Down
C102 0.1u
IC102
C103 0.1u
IC103
4
5
6
7

⟨Index⟩

CONTROL BOARD

IC1	D2
IC2	C2
IC3	C2
IC4	A1,B2
IC5	A2,C4
IC6	A2,B3
IC7	A2,B2,B3,B4
IC8	A2,C4,B4
IC9	A3,B2
IC10	A1,A4
IC11	B3
IC100	C7
IC101	C7
IC102	B7
IC103	B7
Q1	C5
Q2	C4
Q3	C4
Q4	C3
Q5	C4
Q6	B4
D1	C2
D3	B3
D4	B3

SCHEMATIC DIAGRAM OF RI

RECIEVER BOARD

	IC1	IC2	IC3	IC6	IC7	IC8	IC9	IC11	IC12	IC13	IC14	IC15	IC16
Pin 1	0	0	0	0	0	5.0	0	5.0	0	0	0	2.5	0
2	5.0	5.0	0	4.6	0	5.0	2.0	0	0	5.0	0	2.5	3.4
3	4.9	4.9	0	0	0	0.5	5.0	9.9	0	5.0	0	2.5	5.0
4	4.9	5.0	5.0	4.6	5.0	0.1	0		0	2.9	0	0	0
5	0	0	0	4.6	5.0	0.1	1.4		0	5.0	0	0.6	2.5
6	0	0	5.0	5.0		0.8	5.0		0	0	0	0.6	0
7	0	0	0	0		0	5.0		0	5.0	0	0	3.0
8	0.1	5.0	2.5	4.6		5.0	5.0		0	0	0	5.0	0
9	0	5.0	3.4	0.3					0	5.0	0		5.0
10	4.9	0	0	0.3					5.0	0	0		0
11	5.0	0	0	0					0	5.0	1.3		4.6
12	0	0	0	0					5.0	0	1.3		0
13	0	0	2.6	0					0	5.0	1.3		5.0
14	5.0	5.0	5.0	5.0					5.0	5.0	1.3		4.8
15										0	1.3		0
16										5.0	5.0		5.0

	IC4	IC5
Pin 1	5.0	0
2	0	2.5
3	3.4	5.0
4	0	5.0
5	0	5.0
6	0	5.0
7	5.0	5.0
8	0	2.5
9	5.0	3.3
10	0	4.4
11	5.0	5.0
12	4.6	5.0
13	0	5.0
14	0.3	0.5
15	0	0.5
16	0	5.0
17	0	5.0
18	0	5.0
19	5.0	5.0
20	5.0	5.0
21	0	5.0
22	5.0	5.0
23	0	5.0
24	5.0	5.0
25	5.0	5.0
26	0	0
27	5.0	5.0
28	0	5.0
29	0	0
30	5.0	5.0
31	5.0	2.5
32	5.0	5.0

	IC4	IC5
Pin 33	5.0	5.0
34	5.0	0
35	5.0	0
36	5.0	0
37	5.0	0
38	5.0	4.9
39	5.9	0
40	5.0	0
41	5.0	5.0
42	0	0.7
43	4.4	5.0
44	5.0	5.0
45	5.0	5.0
46	4.4	5.0
47	5.0	5.0
48	5.0	0.1
49	0.4	5.0
50	0.4	5.0
51	0	5.0
52	2.5	5.0
53	4.6	5.0
54	0	5.0
55	0.4	0
56	0	5.0
57	0	5.0
58	0	5.0
59	0	0.5
60	0.1	5.0
61	0	0
62	0	0
63	0	0
64	0	5.0

	Q17	Q20	Q22	Q27	Q32	Q34	Q36	Q39	Q43	Q45	Q49	Q51	Q56	Q58
Pin 1	9.6	0	9.5	9.8	5.0	9.8	9.8	5.0	9.8	5.0	9.7	9.9	9.8	8.3
2	2.3	9.5	2.0	4.7	10.0	2.0	2.8	0	4.7	9.8	1.5	2.4	8.3	2.4
3	3.0	3.0	9.5	5.3	9.8	2.6	9.8	9.8	0	9.8	3.2	3.0	8.9	3.0
4	0	0	0	0	0.9	0	2.5	0	4.7	0	2.1	0	5.4	0
5	3.0	2.3	-0.7	5.2	0.4	0	2.2	0	0	0	3.2	3.0	5.4	3.0
6	2.3	3.0	0	4.7	0.3	0	2.7	0	4.6	0	2.5	2.4	4.8	2.4

	B	C	E
Q1	0	5.0	5.0
2	5.0	0	0
3	9.9	9.7	9.9
4	0.1	9.9	0.5
5	0	3.6	0
6	0	3.6	0
7	4.2	5.0	5.0
8	4.4	5.0	5.0
9	0	5.0	5.0
12	2.3	0	2.9
13	2.9	8.6	0
14	8.6	4.9	9.3
15	4.9	9.6	4.2
16	0.2	2.8	2.0
19	5.1	-0.7	5.0
26	0.8	0	1.5
29	4.6	9.8	4.0
30	0	0	5.3
31	4.6	0	4.0
33	2.1	1.5	0
37	-0.2	2.7	0
47	1.9	0	2.5
48	0	1.9	2.1
53	0.1	2.4	2.0
60	0	9.8	0

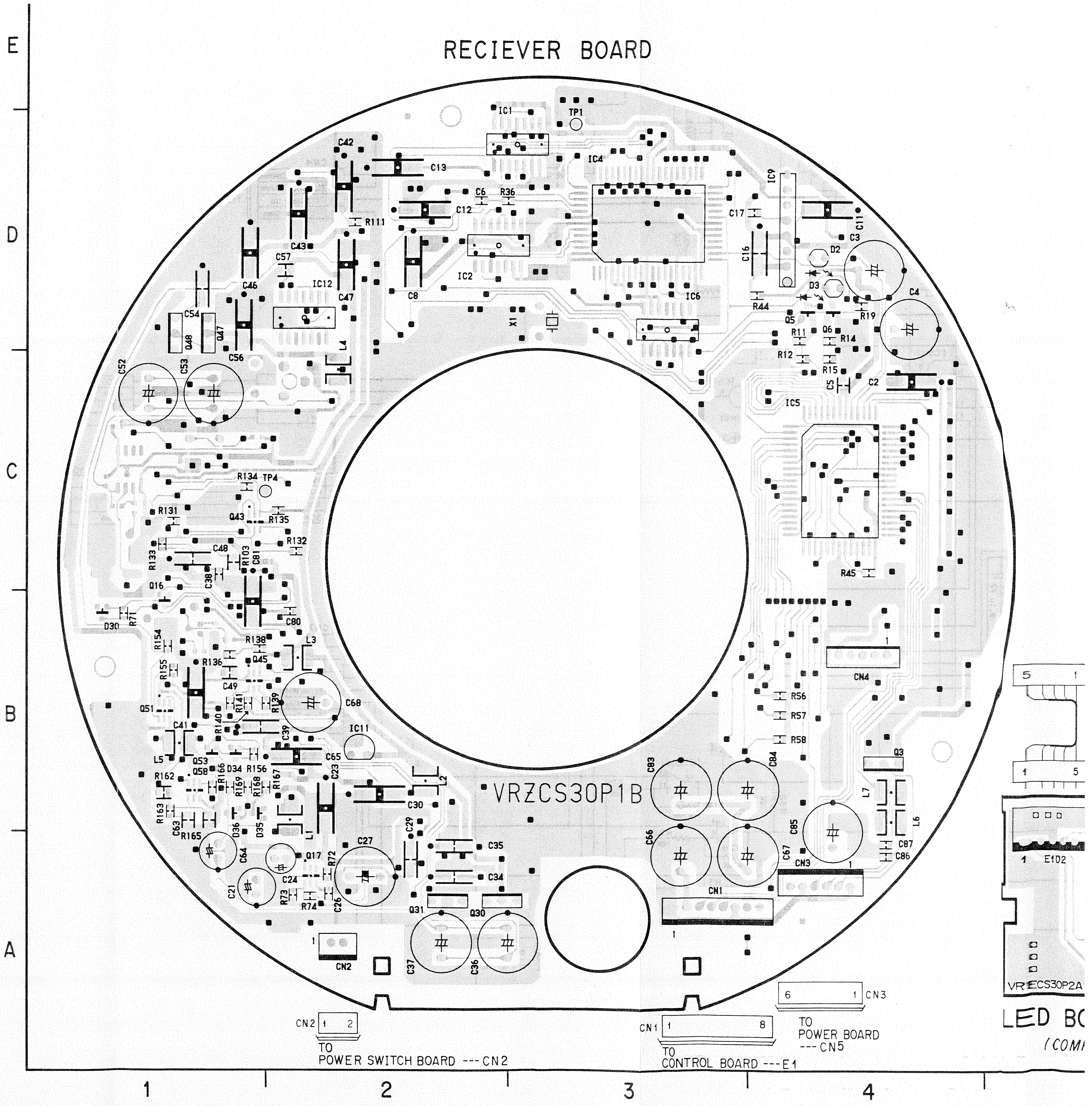
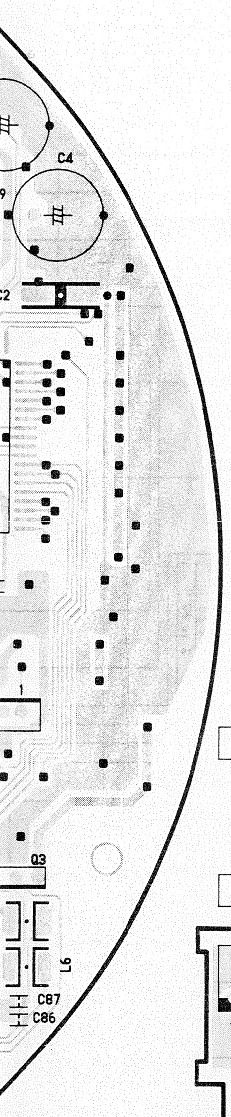
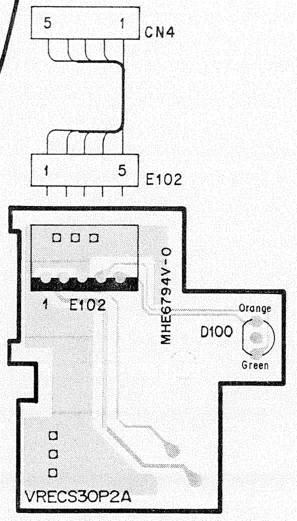

RECIEVER BOARD
E
D
C
B
A
1
2
3
4
VRZCS30P1B
IC1
TP1
IC4
IC9
IC2
IC6
IC12
IC5
IC11
C13
C42
C6
R36
C12
R111
C43
C57
C46
C47
C8
X1
C17
C16
C11
C3
D2
D3
C4
R44
Q5
R19
R11
Q6
R14
R12
R15
C5
C2
C54
Q48
Q47
L4
C53
C52
C56
R134
TP4
R131
Q43
R135
R132
C48
R133
R103
C81
C38
Q16
C80
D30
R71
R154
R138
L3
R136
Q45
R155
C49
R141
R139
C68
Q51
R140
C41
C39
L5
Q53
Q58
D34
R156
C65
C23
R162
R166
R169
R168
R167
C30
R163
C63
R165
D36
D35
L1
C27
C35
C34
C64
Q17
C24
R72
R73
R74
C26
C29
C21
Q31
Q30
C37
C36
C83
C84
C66
C85
C67
CN3
L7
L6
C87
C86
CN4
R56
R57
R58
Q3
R45
CN1
CN2
CN2 1 2
TO
POWER SWITCH BOARD ---CN2
CN1 1 8
TO
CONTROL BOARD ---E1
6 1 CN3
TO
POWER BOARD
---CN5
5 1
1 5
E102
VRECS30P2A
LED BC
(COM

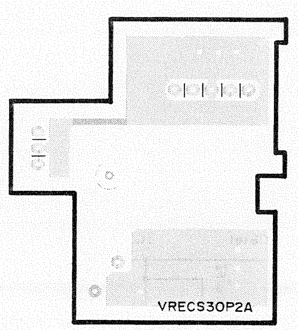
DIAGRAM OF RECIEVER BOARD


C4
C87
C86
Q3
L9


CN4
5
1
E102
MHE6794V-O
D100
Orange
Green
VRECS30P2A

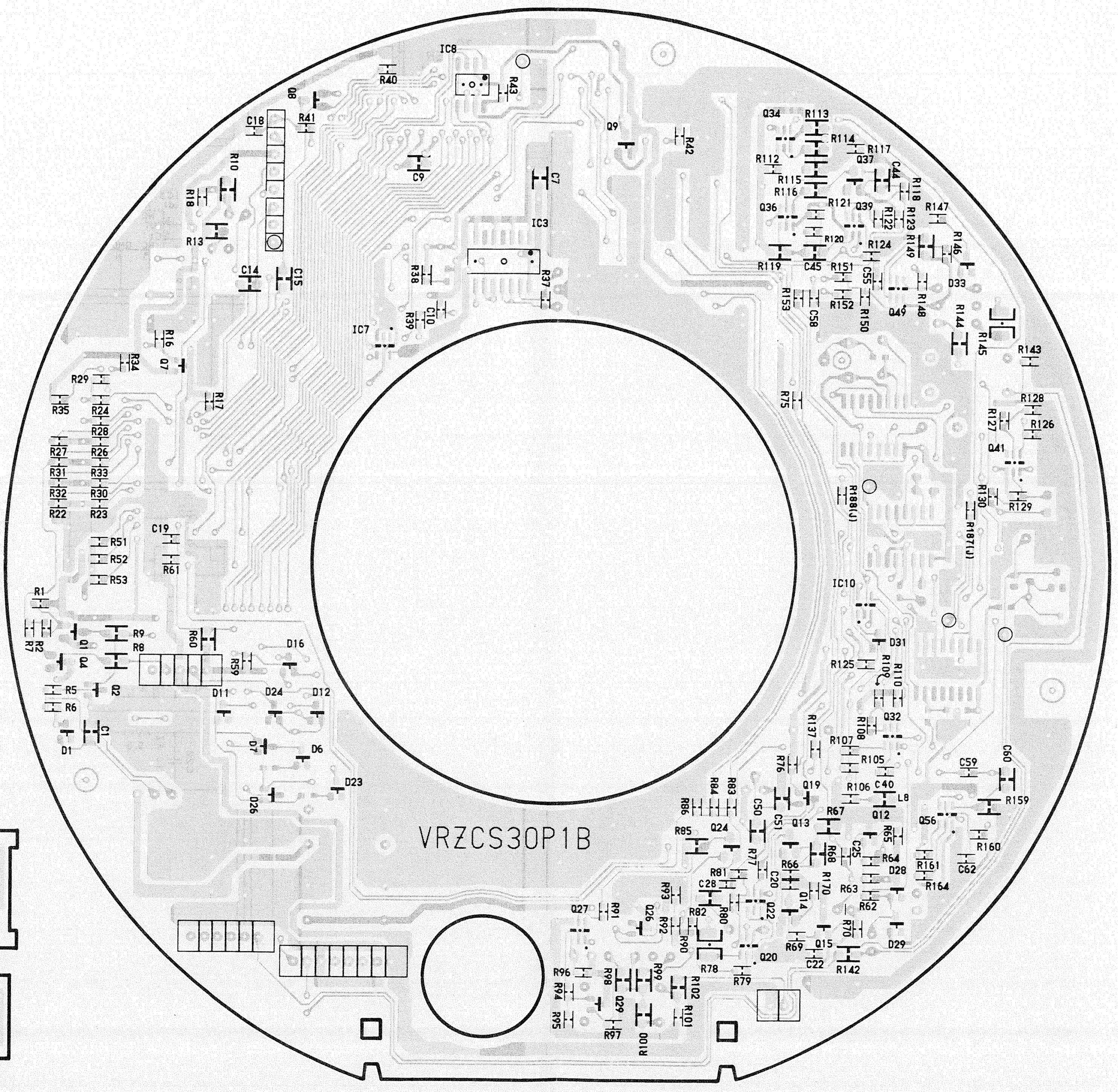
LED BOARD

(COMPONENT SIDE)


VRECS30P2A

LED BOARD

RECIEVER BOARD


VRZCS30P1B
IC3
IC7
IC8
IC10

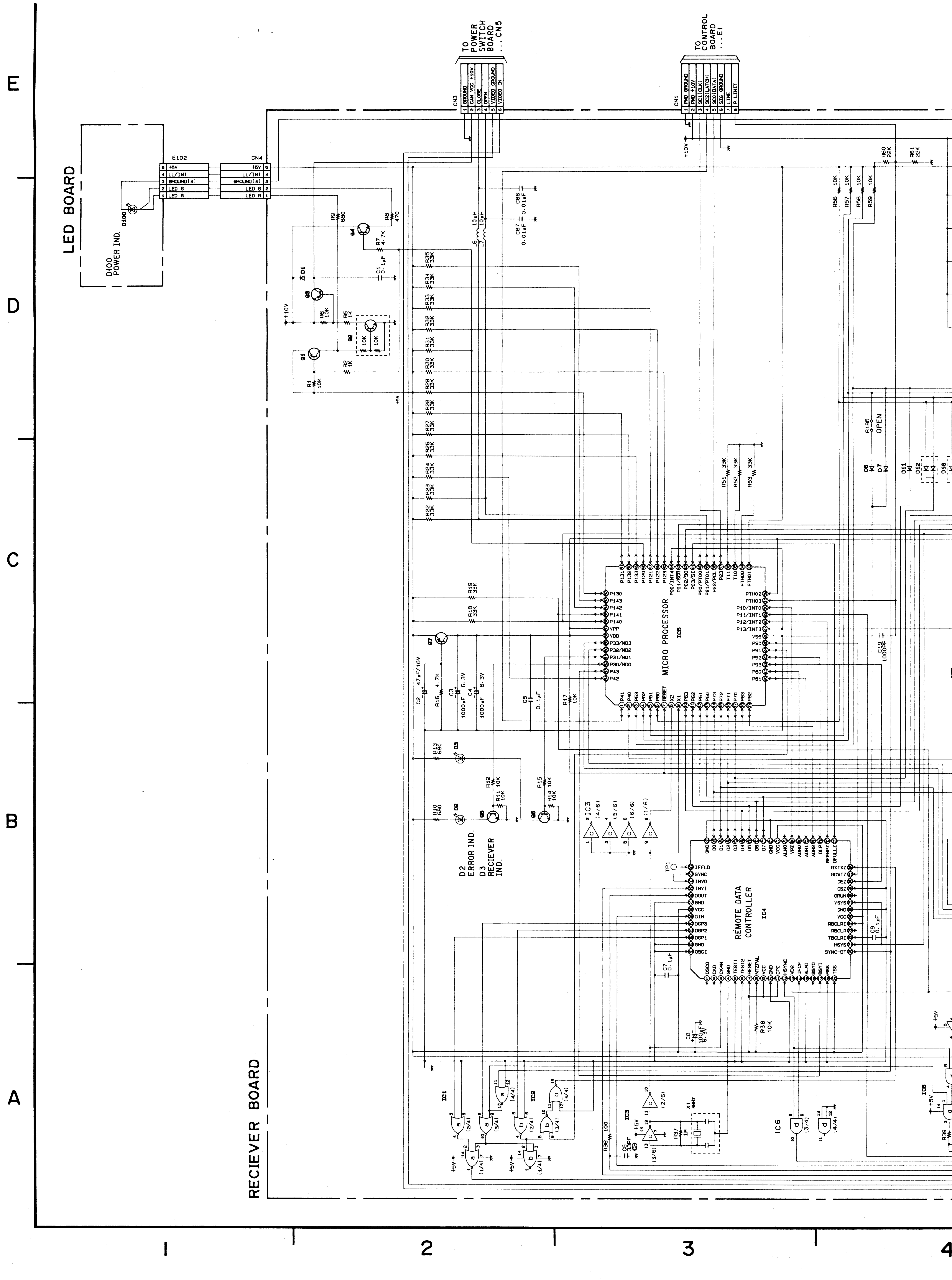
(PATTERN SIDE)

5 6 7 8 9 10

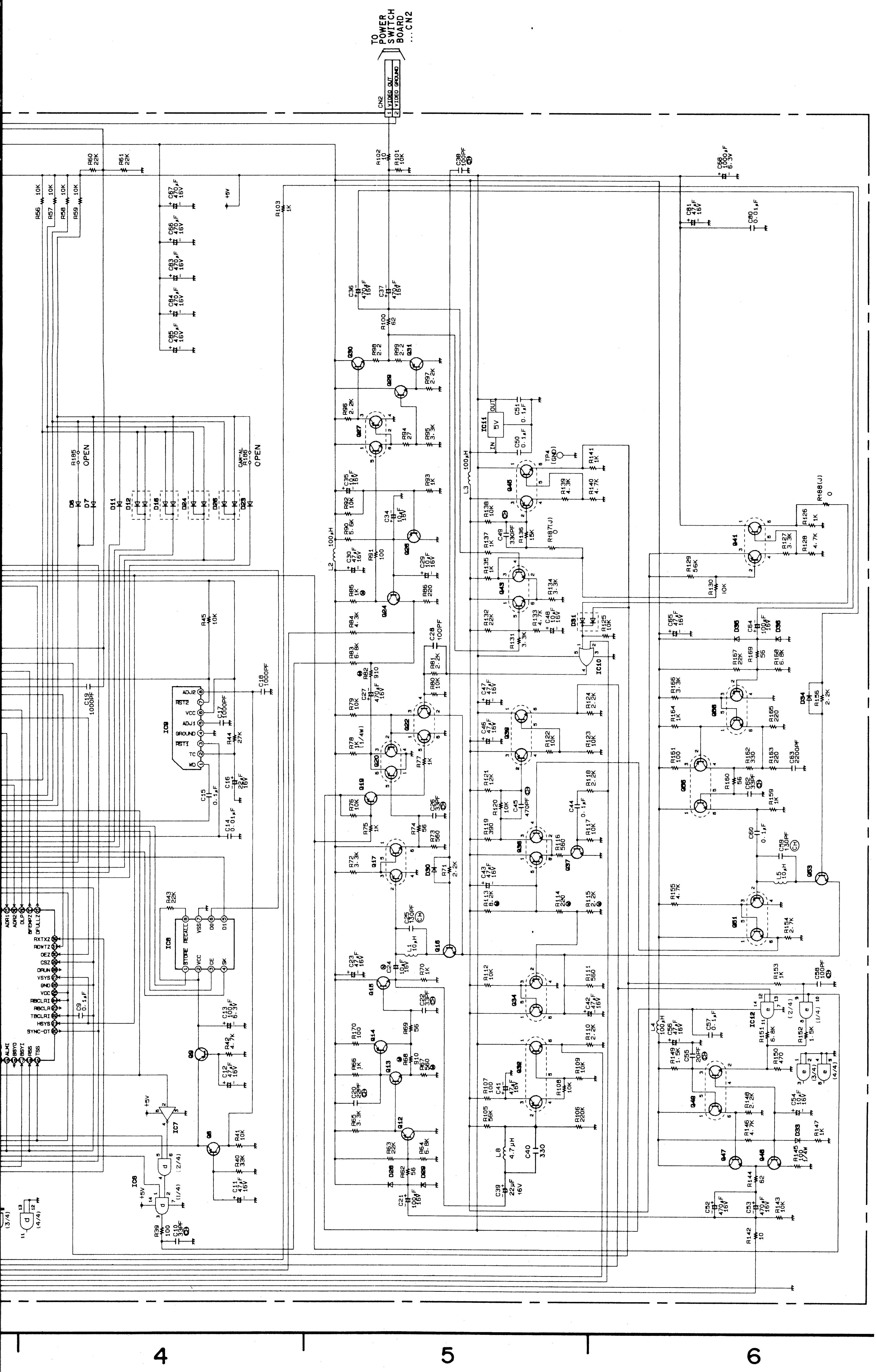
⟨Index⟩
RECIEVER BOARD

IC1	D2
IC2	D2
IC3	D8
IC4	D3
IC5	C4
IC6	D3
IC7	C8
IC8	C8
IC9	D4
IC10	C9
IC11	B2
IC12	D2
IC13	C9
IC14	B10
IC15	C1
IC16	C9
Q1	B7
Q2	B7
Q3	B4
Q4	B7
Q5	D4
Q6	D4
Q7	C7
Q8	D7
Q9	D9
Q12	B10
Q13	B9
Q14	A9
Q15	A9
Q16	B1
Q17	A2
Q19	B9
Q20	A9
Q22	A9
Q24	B9
Q26	A9
Q27	A8
Q29	A9
Q30	A2
Q31	A2
Q32	B10
Q34	D9
Q36	D9
Q37	D9
Q39	D9
Q41	C10
Q43	C1
Q45	B1
Q47	D1
Q48	D1
Q49	D10
Q51	B1
Q53	B1
Q56	B10
Q58	B1
Q60	B1
D1	B7
D2	D4
D3	D4
D6	B7
D11	B7
D12	B7
D16	B7
D23	B8
D24	B7
D26	B7
D28	A10
D29	A10
D30	B1
D31	B10
D33	D10
D45	B1
D35	B1
D36	B1
D37	B1
D38	C10

CONDUCTOR VIEW OF RECIEVER BO


E
D
C
B
A
1
2
3
4
LED BOARD
D100 POWER IND.
D100
E102
CN4
+5V
LL/INT
GROUND(4)
LED G
LED R
TO POWER SWITCH BOARD ...CN5
CN3
GROUND
CAM VCC +10V
CLOSE
OPEN
VIDEO GROUND
VIDEO IN
TO CONTROL BOARD ...E1
CN1
PWO GROUND
PWO +10V
SCI(CLK)
SCI(LATCH)
SCI(DATA)
SIG GROUND
LINE
P.LIMIT
+10V
+5V
Q1
Q2
Q3
Q4
Q5
Q6
Q7
D1
D2
D3
R1 10K
R2 1K
R5 1K
R6 10K
R7 4.7K
R8 470
R9 680
C1 0.1µF
L6 10µH
L7 10µH
C86 0.01µF
C87 0.01µF
R22 33K
R23 33K
R24 33K
R26 33K
R27 33K
R28 33K
R29 33K
R30 33K
R31 33K
R32 33K
R33 33K
R34 33K
R35 33K
R18 33K
R19 33K
R51 33K
R52 33K
R53 33K
R56 10K
R57 10K
R58 10K
R59 10K
R60 22K
R61 22K
R185 OPEN
D6
D7
D11
D12
D16
C19 1000PF
MICRO PROCESSOR
IC5
C2 47µF/16V
R16 4.7K
C3 1000µF 6.3V
C4 1000µF 6.3V
C5 0.1µF
R17 10K
R13 680
R10 680
R12 10K
R11 10K
R15 10K
R14 10K
D2 ERROR IND.
D3 RECIEVER IND.
IC3 (4/6)
(5/6)
(6/6)
(1/6)
TP1
REMOTE DATA CONTROLLER
IC4
C7 0.1µF
C9 0.1µF
C8
R38 10K
IC1
IC2
IC3
IC6
IC8
(1/4)
(2/4)
(3/4)
(4/4)
(2/6)
(3/6)
X1 4MHz
R36 100
R37 1M
C6 33PF
R39
RECIEVER BOARD

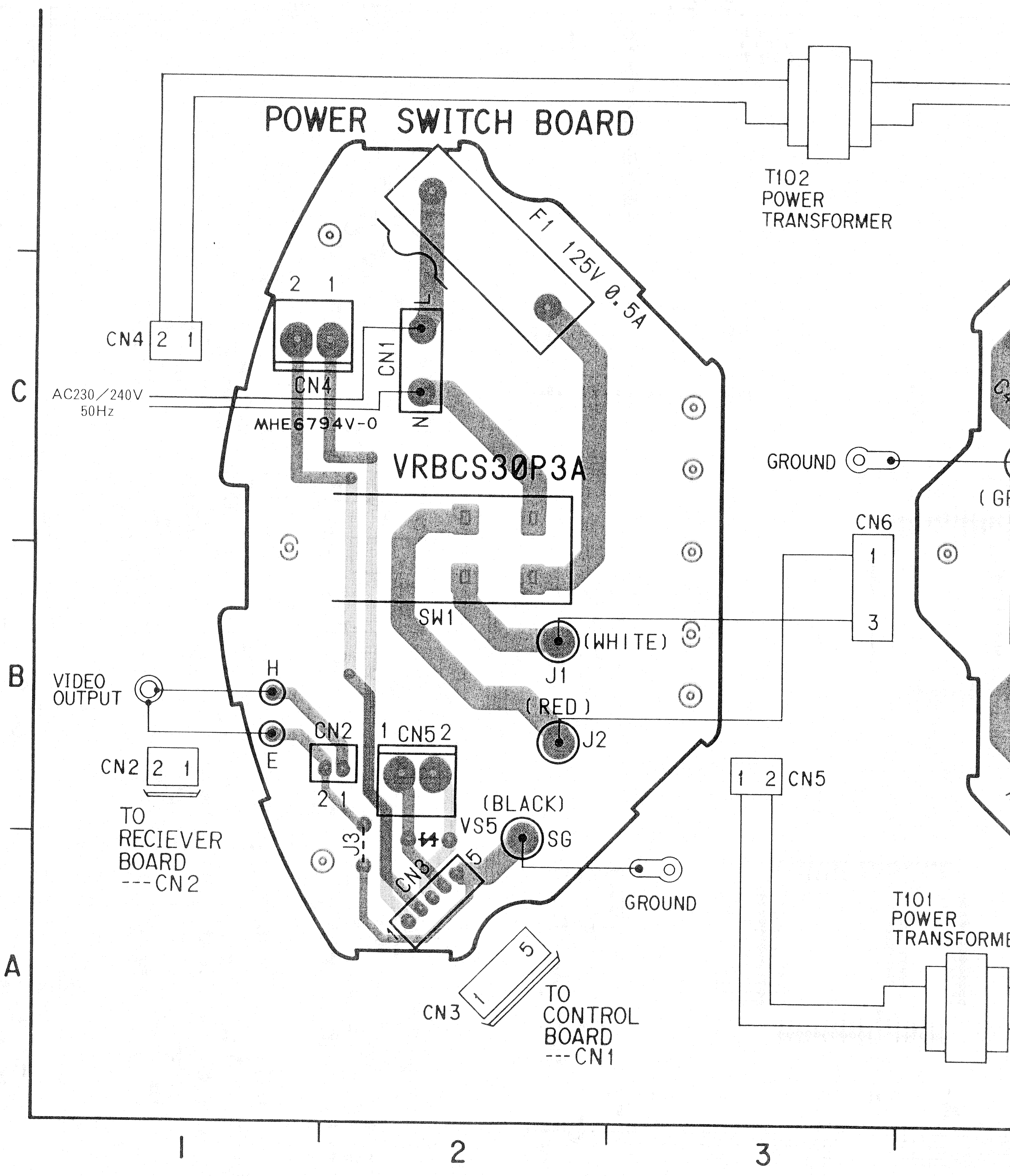
OF RECIEVER BOARD


TO POWER SWITCH BOARD ...CN2
CN2
1 VIDEO OUT
2 VIDEO GROUND
IC7
IC8
IC9
IC10
IC11
IC12
5V
IN
OUT
TP4 (GND)
R185 OPEN
R186 OPEN
ADJ2
RST2
VCC
ADJ1
GROUND
RST1
TC
STORE
RECALL
VSS
DO
DI
CE
SK
RXTXZ
RDWTZ
OEZ
CSZ
DRUN
VSYS
GND
VCC
RBCLRI
TBCLRI
HSYS
SYNC-OT
+5V
4
5
6

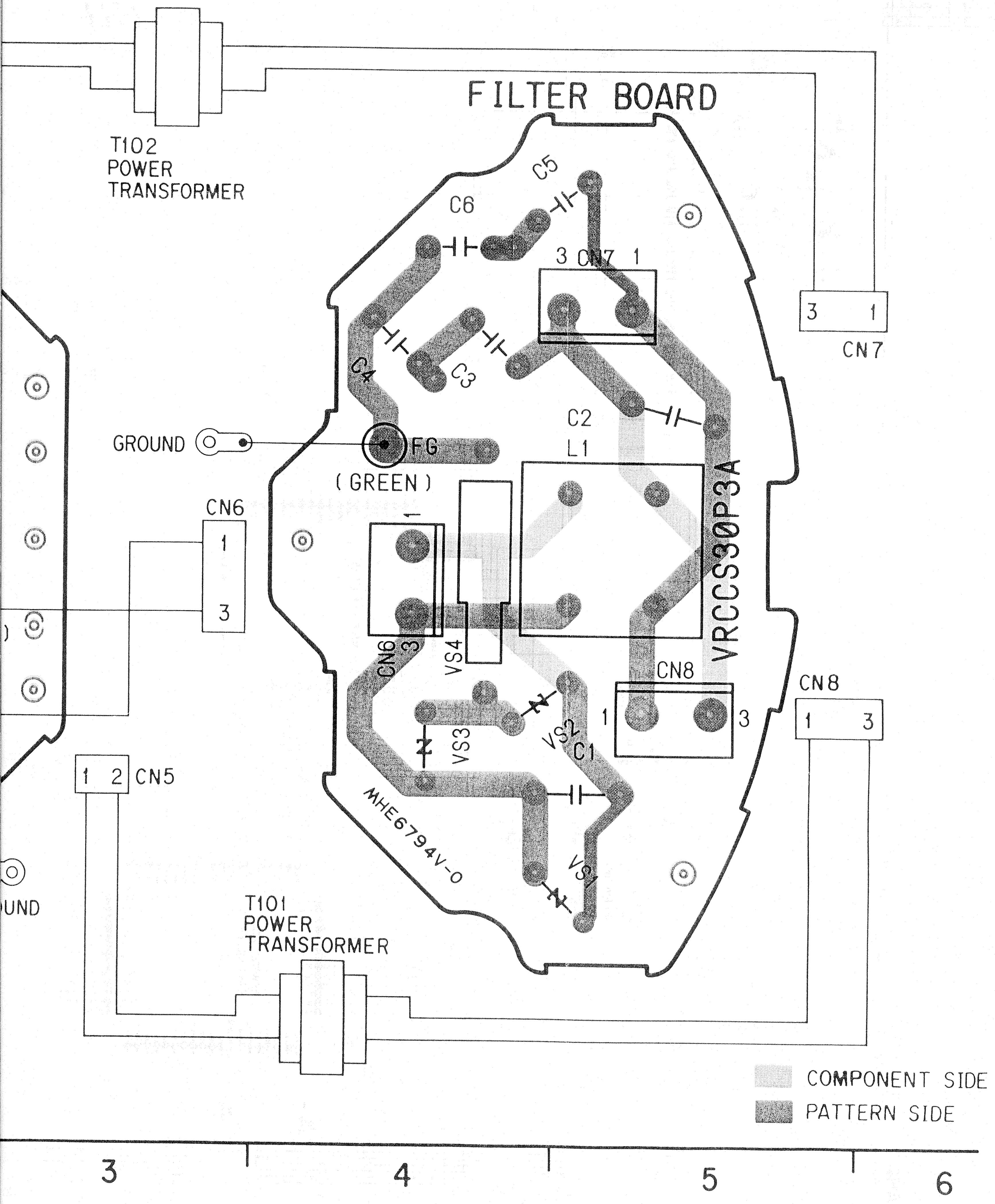
⟨Index⟩
RECIEVER BOARD

IC1	A2
IC2	A2,A3
IC3	A3,B3
IC4	B3
IC5	C3
IC6	A3,A4
IC7	A4
IC8	B4
IC9	C4
IC10	C6
IC11	D5
IC12	A6,B6
IC13	D6
IC14	D6
IC15	D5
IC16	D5
Q1	D2
Q2	D2
Q3	D2
Q4	D2
Q5	B2
Q6	B2
Q7	C2
Q8	A4
Q9	A4
Q12	A5
Q13	A5
Q14	B5
Q15	B5
Q16	B5
Q17	B5
Q19	B5
Q20	B5
Q22	C5
Q24	C5
Q26	C5
Q27	D5
Q29	D5
Q30	D5
Q31	D5
Q32	A5
Q34	B5
Q36	B5
Q37	B5
Q39	C5
Q41	C6
Q43	C5
Q45	C5
Q47	A6
Q48	A6
Q49	A6
Q51	B6
Q53	B6
Q56	B6
Q58	C6
Q60	D6
D1	D2
D2	B2
D3	B2
D6	C4
D11	C4
D12	C4
D16	C4
D23	C4
D24	C4
D26	C4
D28	AA5
D29	A5
D30	B5
D31	C5
D33	A6
D34	C6
D35	C6
D36	C6
D37	D6
D38	D6

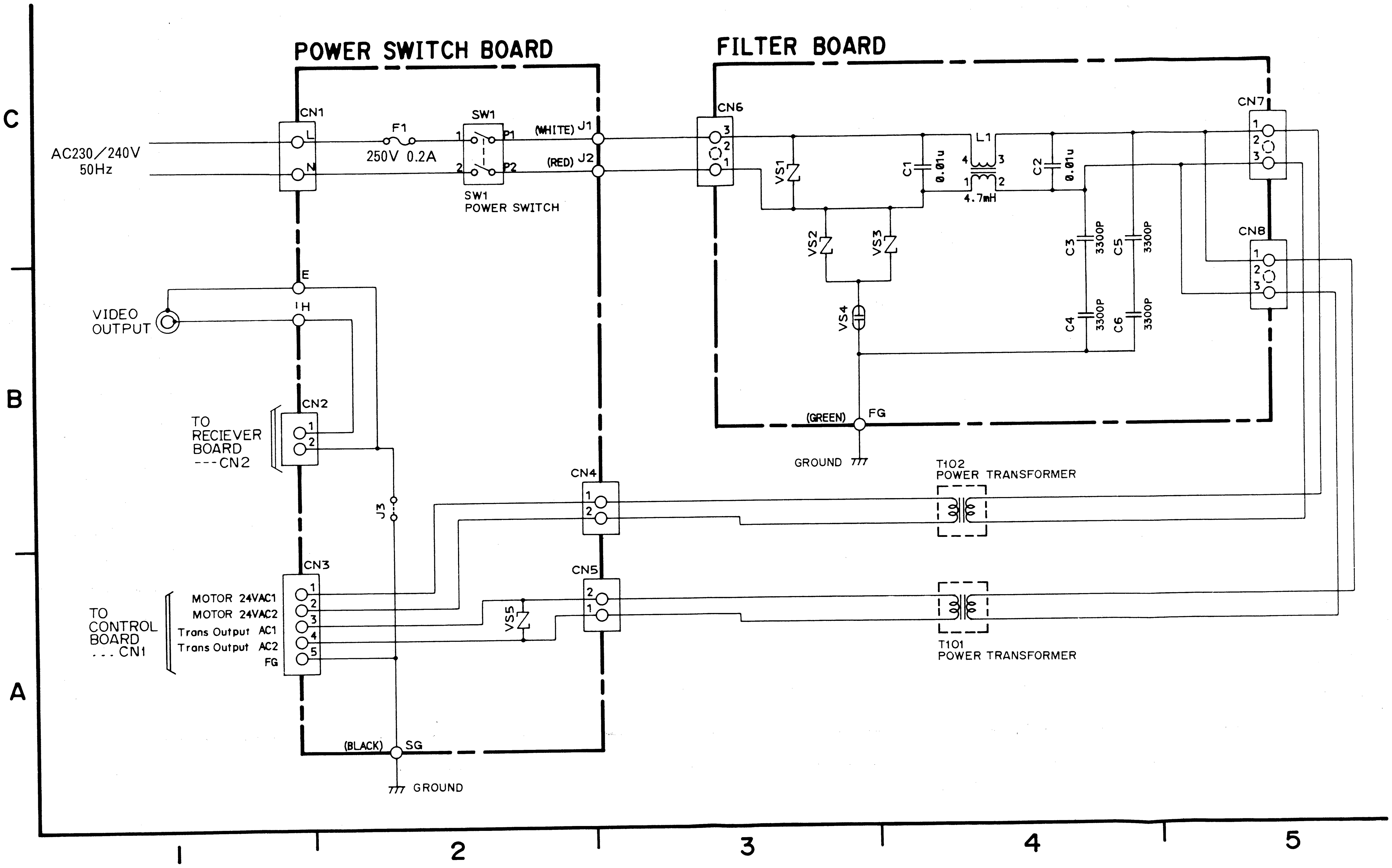
CONDUCTOR VIEW OF POWER SWITCH/FILT


POWER SWITCH BOARD
T102
POWER
TRANSFORMER
F1 125V 0.5A
2 1
CN4 2 1
CN4
CN1
L
N
C
AC230/240V
50Hz
MHE6794V-0
VRBCS30P3A
GROUND
(GR
CN6
1
3
SW1
(WHITE)
J1
(RED)
J2
B
VIDEO
OUTPUT
H
E
CN2
2 1
1 CN5 2
CN2 2 1
TO
RECIEVER
BOARD
---CN2
1 2 CN5
(BLACK)
VS5
SG
J3
CN3
5
1
GROUND
T101
POWER
TRANSFORME
A
CN3
1
5
TO
CONTROL
BOARD
---CN1
1
2
3

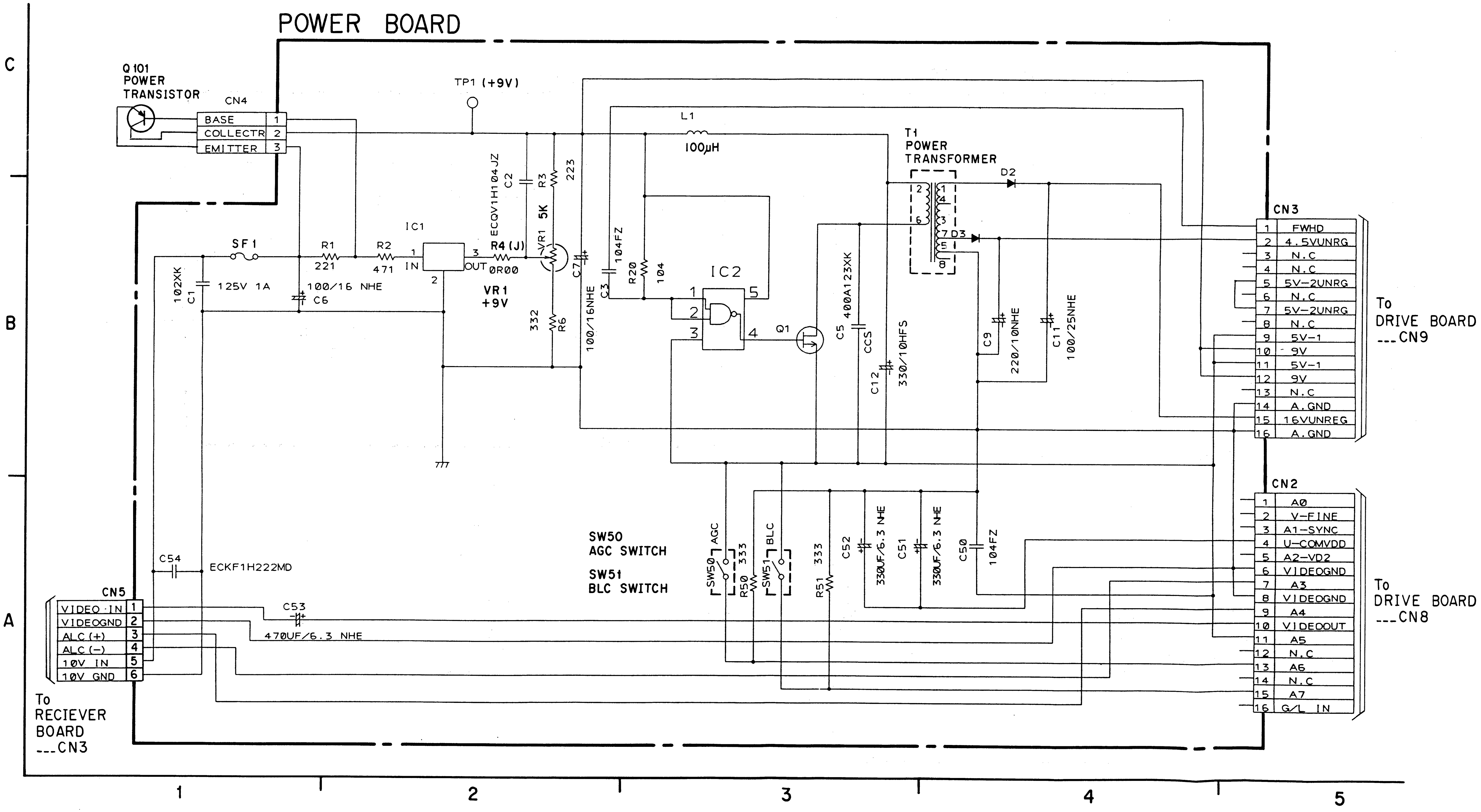
VIEW OF POWER SWITCH/FILTER BOARD


FILTER BOARD
T102
POWER
TRANSFORMER
C5
C6
3 CN7 1
3 1
CN7
C4
C3
C2
L1
GROUND
FG
(GREEN)
CN6
1
3
1
CN6 3
VS4
VRCCS30P3A
CN8
1
3
CN8
1 3
VS3
VS2
C1
VS1
MHE6794V-0
1 2 CN5
UND
T101
POWER
TRANSFORMER
COMPONENT SIDE
PATTERN SIDE
3
4
5
6

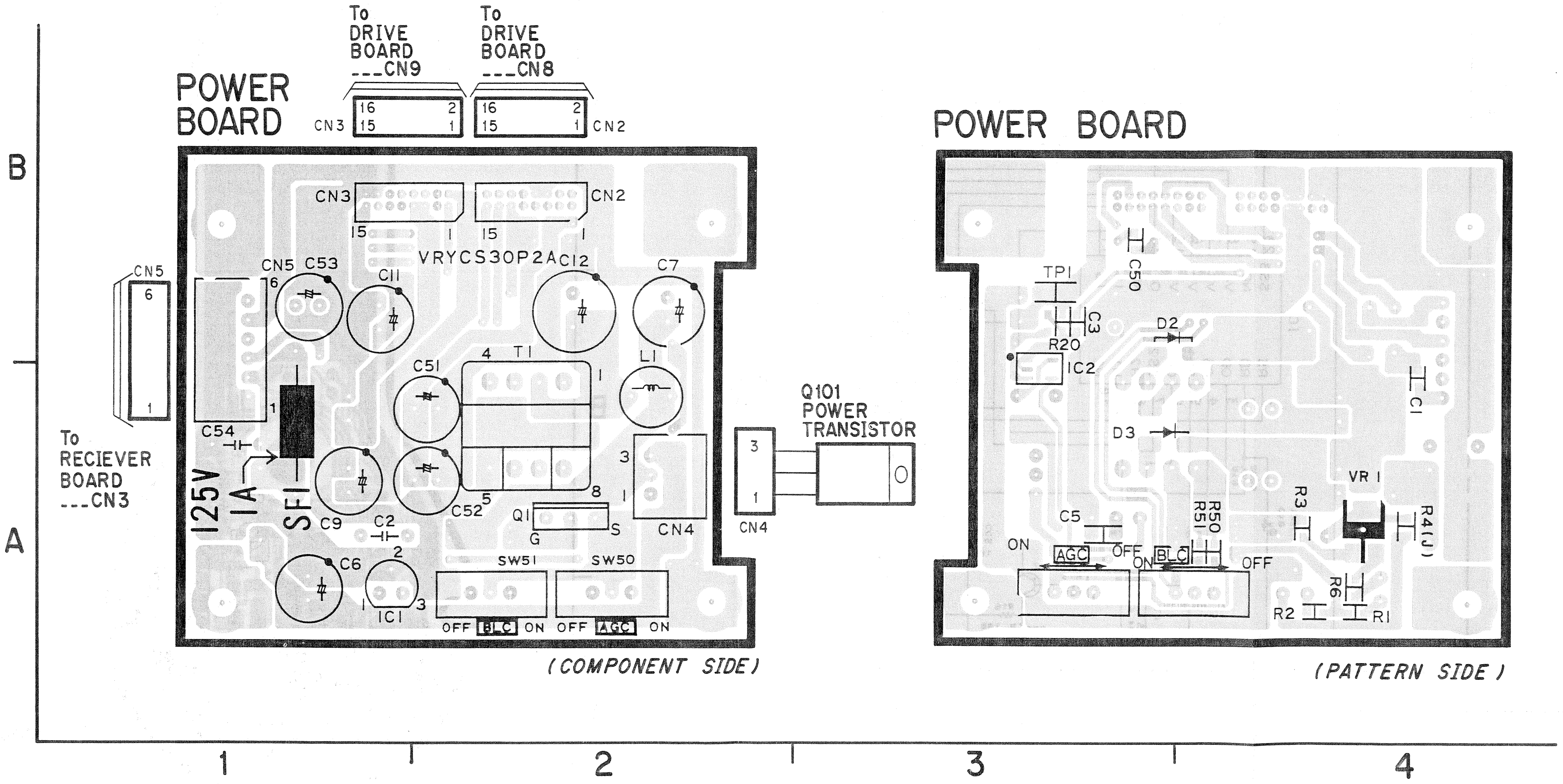
SCHEMATIC DIAGRAM OF POWER SWITCH/FILTER BOARD


POWER SWITCH BOARD
FILTER BOARD
C
B
A
1
2
3
4
5
AC230/240V
50Hz
CN1
L
N
F1
250V 0.2A
SW1
1
2
P1
P2
SW1
POWER SWITCH
(WHITE) J1
(RED) J2
CN6
3
2
1
VS1
C1
0.01u
L1
4
3
1
2
4.7mH
C2
0.01u
CN7
1
2
3
VS2
VS3
VS4
C3
3300P
C5
3300P
C4
3300P
C6
3300P
CN8
1
2
3
(GREEN)
FG
GROUND
E
H
VIDEO
OUTPUT
CN2
1
2
TO
RECIEVER
BOARD
---CN2
J3
CN4
1
2
T102
POWER TRANSFORMER
CN3
1
2
3
4
5
TO
CONTROL
BOARD
...CN1
MOTOR 24VAC1
MOTOR 24VAC2
Trans Output AC1
Trans Output AC2
FG
VS5
CN5
2
1
T101
POWER TRANSFORMER
(BLACK)
SG
GROUND

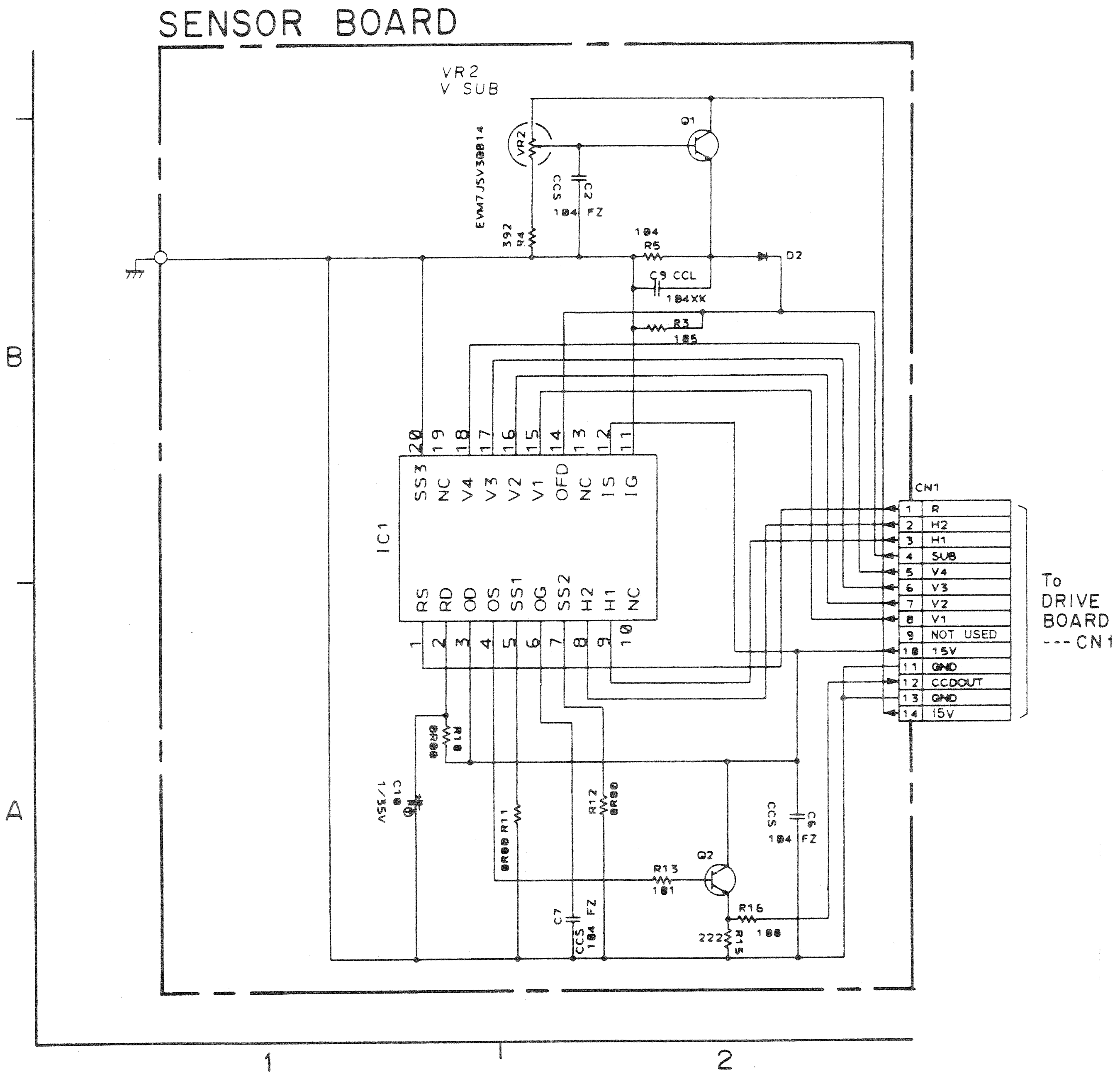
SCHEMATIC DIAGRAM OF POWER BOARD


POWER BOARD
C
B
A
1
2
3
4
5
Q101
POWER
TRANSISTOR
CN4
BASE 1
COLLECTR 2
EMITTER 3
TP1 (+9V)
L1
100μH
T1
POWER
TRANSFORMER
D2
D3
SF1
125V 1A
R1
221
R2
471
IC1
1 IN
3 OUT
2
R4 (J)
0R00
VR1
+9V
ECQV1H104JZ
C2
R3
223
VR1
5K
C7
332
R6
100/16NHE
C1
102XK
100/16 NHE
C6
C3
104FZ
R20
104
IC2
1
2
3
4
5
Q1
C5
400A123XK
CCS
C12
330/10HFS
C9
220/10NHE
C11
100/25NHE
CN3
1 FWHD
2 4.5VUNRG
3 N.C
4 N.C
5 5V-2UNRG
6 N.C
7 5V-2UNRG
8 N.C
9 5V-1
10 9V
11 5V-1
12 9V
13 N.C
14 A.GND
15 16VUNREG
16 A.GND
To
DRIVE BOARD
---CN9
SW50
AGC SWITCH
SW51
BLC SWITCH
SW50 AGC
R50 333
SW51 BLC
R51 333
C52
330UF/6.3 NHE
C51
330UF/6.3 NHE
C50
104FZ
CN2
1 A0
2 V-FINE
3 A1-SYNC
4 U-COMVDD
5 A2-VD2
6 VIDEOGND
7 A3
8 VIDEOGND
9 A4
10 VIDEOUT
11 A5
12 N.C
13 A6
14 N.C
15 A7
16 G/L IN
To
DRIVE BOARD
---CN8
C54
ECKF1H222MD
C53
470UF/6.3 NHE
CN5
VIDEO IN 1
VIDEOGND 2
ALC (+) 3
ALC (-) 4
10V IN 5
10V GND 6
To
RECIEVER
BOARD
---CN3

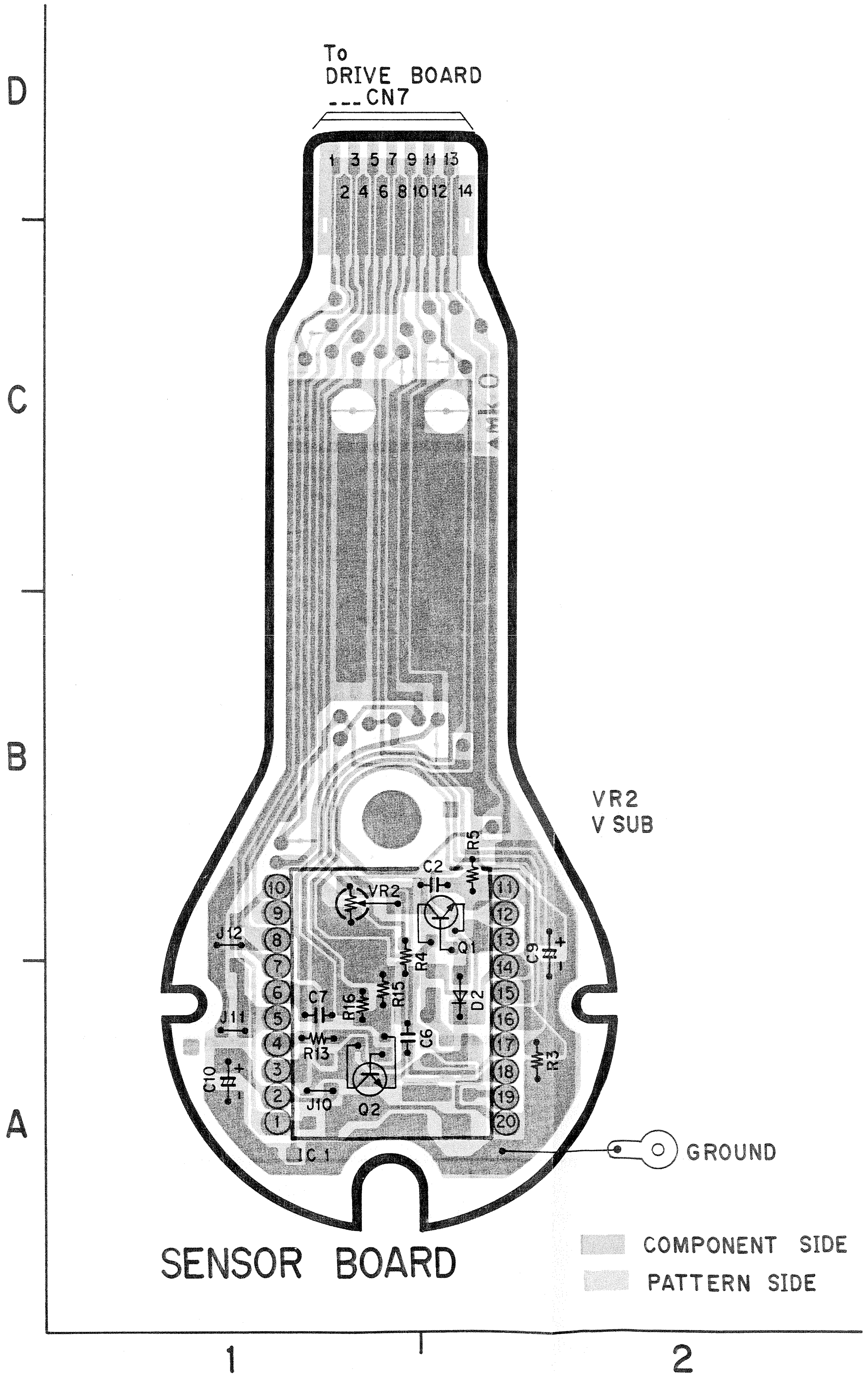
CONDUCTOR VIEW OF POWER BOARD

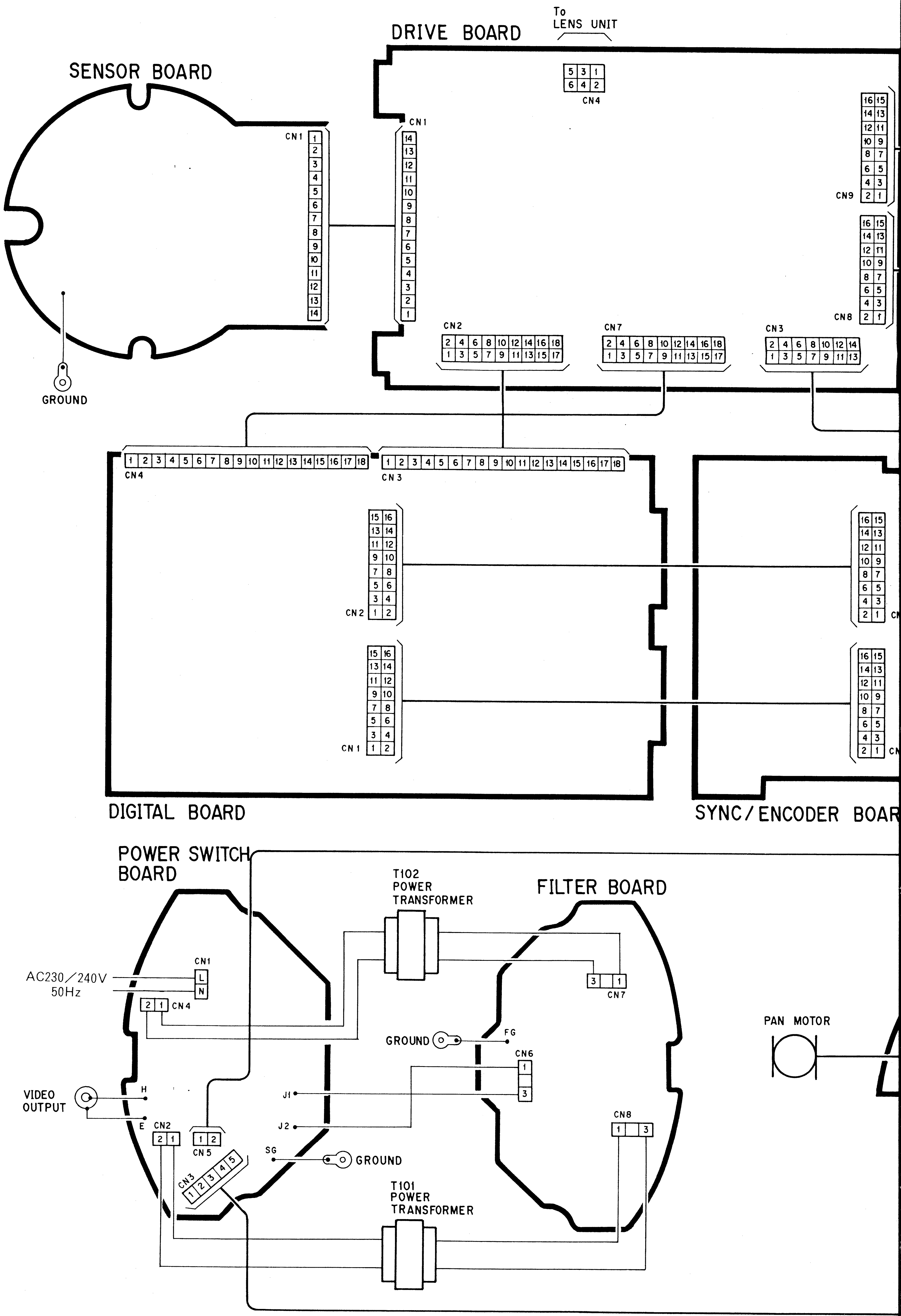

POWER BOARD
To DRIVE BOARD ---CN9
To DRIVE BOARD ---CN8
CN3
CN2
16
15
2
1
15
1
VRYCS30P2A
CN5
C53
C11
C12
C7
6
1
T1
4
L1
C51
C52
5
8
3
Q1
G
S
CN4
C54
SF1
125V
1A
C9
C2
2
C6
IC1
3
SW51
SW50
OFF BLC ON
OFF AGC ON
To RECIEVER BOARD ---CN3
Q101 POWER TRANSISTOR
(COMPONENT SIDE)
POWER BOARD
TP1
C50
C3
R20
D2
IC2
C1
D3
VR1
R3
R50
R51
R4(J)
C5
ON
AGC
OFF
ON
BLC
OFF
R6
R2
R1
(PATTERN SIDE)
A
B
1
2
3
4

SCHEMATIC DIAGRAM OF SENSOR BOARD

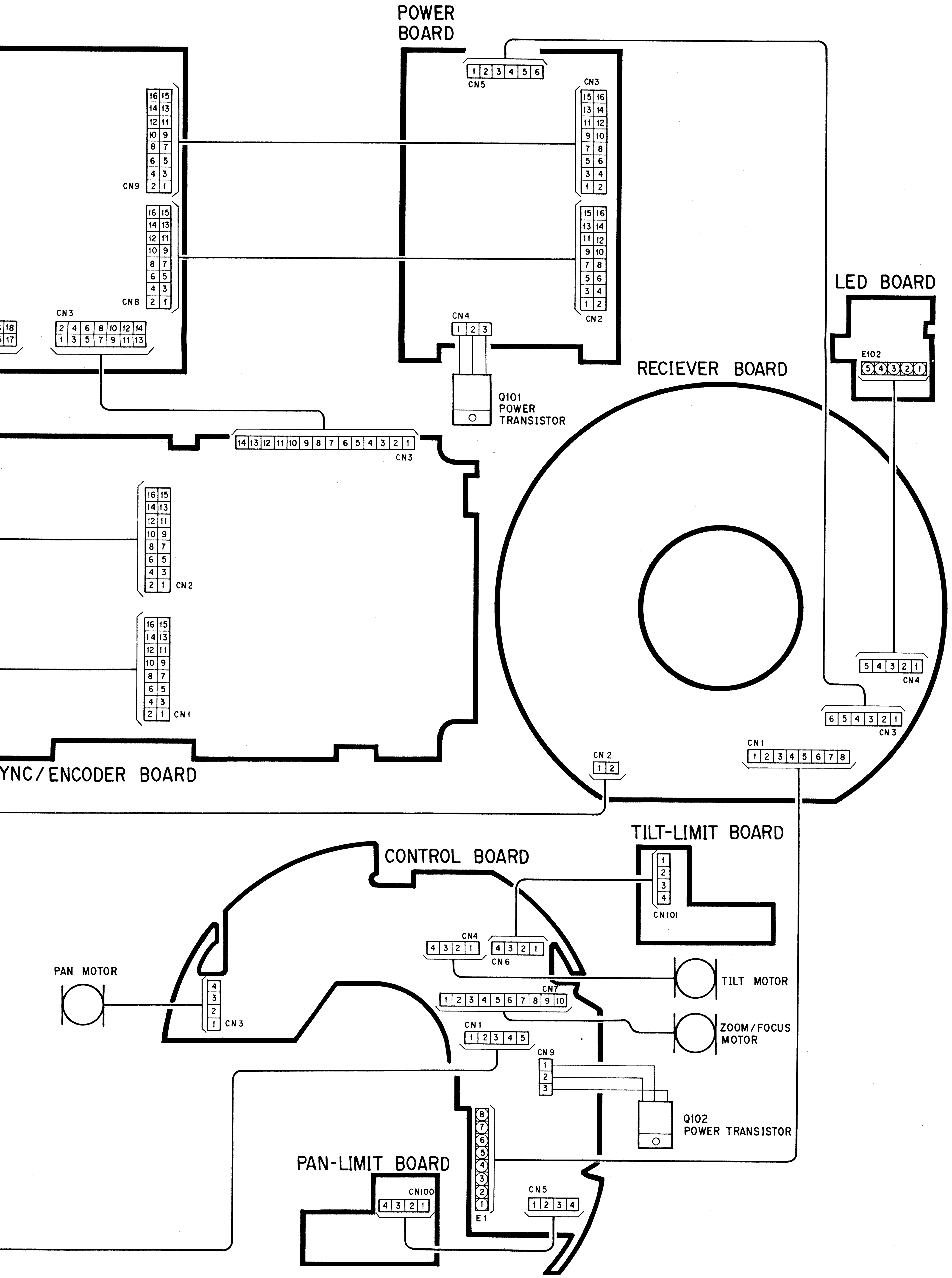

SENSOR BOARD
VR2
V SUB
EVM7JSV30B14
VR2
Q1
CCS
C2
104 FZ
392
R4
104
R5
D2
C9 CCL
104XK
R3
105
IC1
SS3
NC
V4
V3
V2
V1
OFD
NC
IS
IG
RS
RD
OD
OS
SS1
OG
SS2
H2
H1
NC
CN1
1 R
2 H2
3 H1
4 SUB
5 V4
6 V3
7 V2
8 V1
9 NOT USED
10 15V
11 GND
12 CCDOUT
13 GND
14 15V
To
DRIVE
BOARD
---CN1
R10
0R00
C10
1/35V
R11
0R00
R12
0R00
CCS
C6
104 FZ
Q2
R13
101
R16
100
222
R15
C7
CCS
104 FZ
B
A
1
2

CONDUCTOR VIEW OF SENSOR BOARD


D
C
B
A
1
2
To
DRIVE BOARD
---CN7
1 3 5 7 9 11 13
2 4 6 8 10 12 14
VR2
V SUB
R5
C2
VR2
Q1
J12
R4
C9
C7
R16
R15
D2
J11
R13
C6
R3
C10
J10
Q2
IC1
GROUND
SENSOR BOARD
COMPONENT SIDE
PATTERN SIDE


SENSOR BOARD
CN1
GROUND
DRIVE BOARD
To
LENS UNIT
CN4
CN1
CN9
CN8
CN2
CN7
CN3
CN4
CN3
CN2
CN1
DIGITAL BOARD
SYNC/ENCODER BOAR
POWER SWITCH
BOARD
T102
POWER
TRANSFORMER
FILTER BOARD
CN1
L
N
AC230/240V
50Hz
CN4
CN7
GROUND
FG
CN6
PAN MOTOR
VIDEO
OUTPUT
H
E
CN2
CN5
CN3
J1
J2
SG
GROUND
CN8
T101
POWER
TRANSFORMER

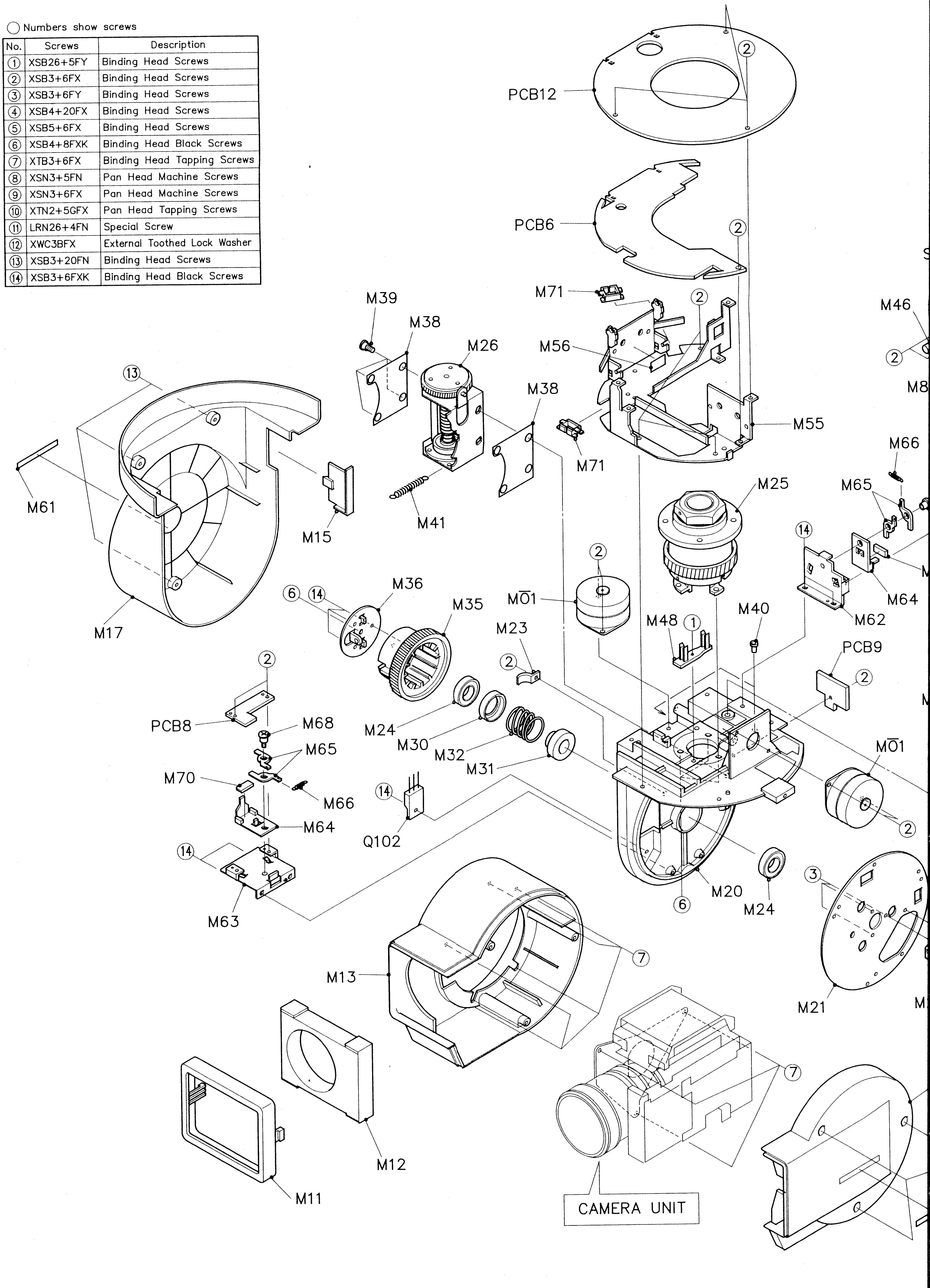
WIRING


POWER BOARD
CN5
CN3
CN9
CN8
CN2
CN4
Q101 POWER TRANSISTOR
LED BOARD
E102
RECIEVER BOARD
CN3
CN2
CN1
YNC/ENCODER BOARD
CN4
CN3
CN2
CN1
TILT-LIMIT BOARD
CN101
CONTROL BOARD
CN4
CN6
CN7
PAN MOTOR
CN3
TILT MOTOR
ZOOM/FOCUS MOTOR
CN1
CN9
Q102 POWER TRANSISTOR
PAN-LIMIT BOARD
CN100
E1
CN5

EXPLDED VIEW
COMBINATION CAMERA (WV-

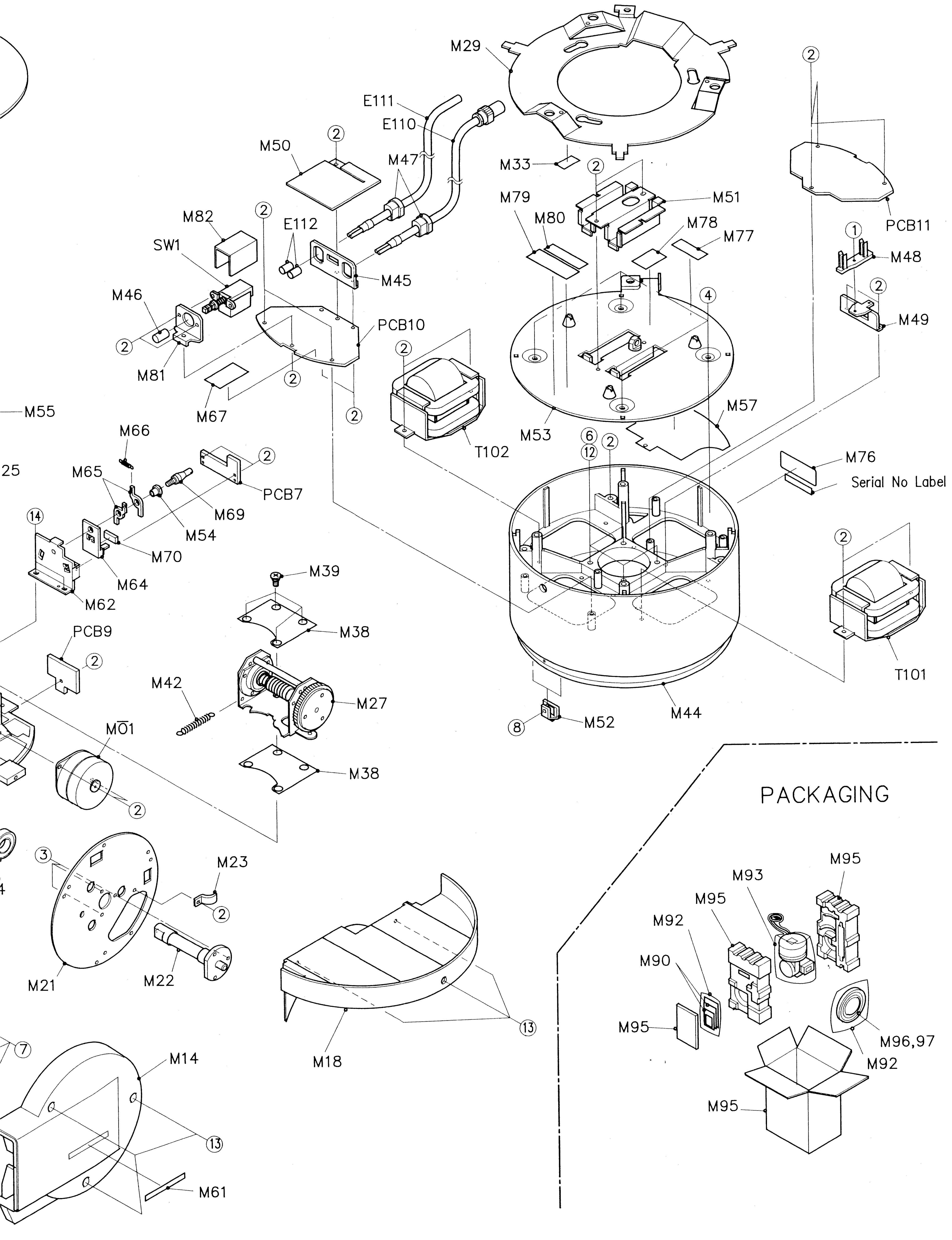
○ Numbers show screws

No.	Screws	Description
①	XSB26+5FY	Binding Head Screws
②	XSB3+6FX	Binding Head Screws
③	XSB3+6FY	Binding Head Screws
④	XSB4+20FX	Binding Head Screws
⑤	XSB5+6FX	Binding Head Screws
⑥	XSB4+8FXK	Binding Head Black Screws
⑦	XTB3+6FX	Binding Head Tapping Screws
⑧	XSN3+5FN	Pan Head Machine Screws
⑨	XSN3+6FX	Pan Head Machine Screws
⑩	XTN2+5GFX	Pan Head Tapping Screws
⑪	LRN26+4FN	Special Screw
⑫	XWC3BFX	External Toothed Lock Washer
⑬	XSB3+20FN	Binding Head Screws
⑭	XSB3+6FXK	Binding Head Black Screws



PCB12
②
PCB6
②
M71
②
M46
②
M39
M38
M26
M56
M38
M8
M55
M71
M66
⑬
M61
M15
M41
M25
M65
⑭
②
M01
M36
⑥
⑭
M35
M23
M48
①
M40
M64
M62
M17
PCB9
②
②
PCB8
M68
M65
M24
M30
M32
M31
M01
M70
M66
M64
⑭
Q102
②
⑭
③
M63
M20
⑥
M24
⑦
M13
M21
⑦
M12
M11
CAMERA UNIT

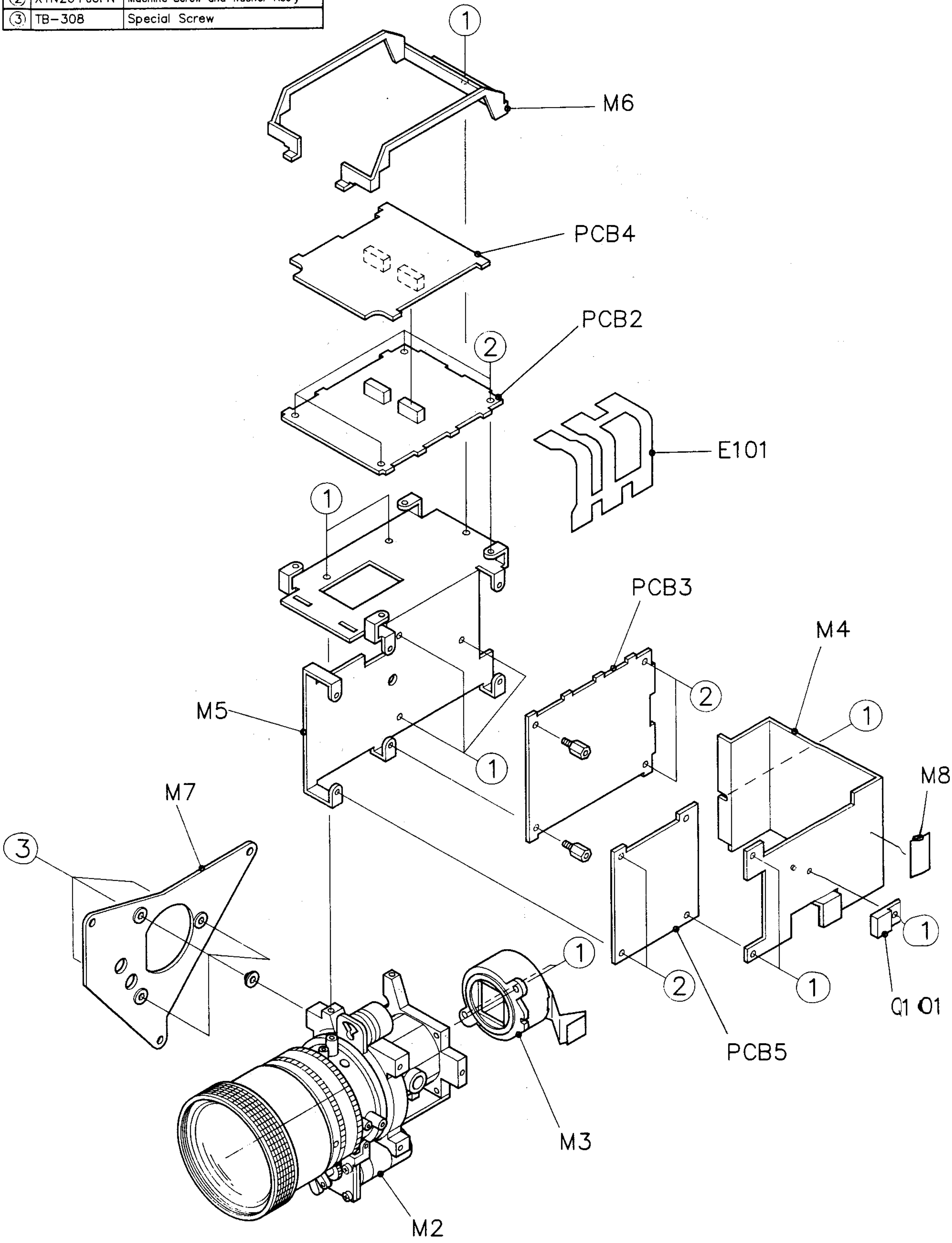
XPLDED VIEW
N CAMERA (WV-CS300)


M29
E111
E110
M50
②
M47
M33
②
M51
M79
M80
M78
M77
M82
②
E112
SW1
M45
M46
②
PCB10
②
M81
②
M67
②
T102
M53
M57
④
②
PCB11
①
M48
②
M49
M55
M66
25
M65
M69
PCB7
②
M54
M70
⑭
M64
M62
⑥
⑫
②
M76
Serial No Label
M39
M38
PCB9
②
M42
M27
MO1
M38
②
②
T101
M44
⑧
M52
PACKAGING
③
M23
②
M21
M22
⑬
M18
M95
M93
M95
M92
M90
M95
M96,97
M92
M95
⑦
M14
⑬
M61
4

EXPLODED VIEW
CAMERA UNIT

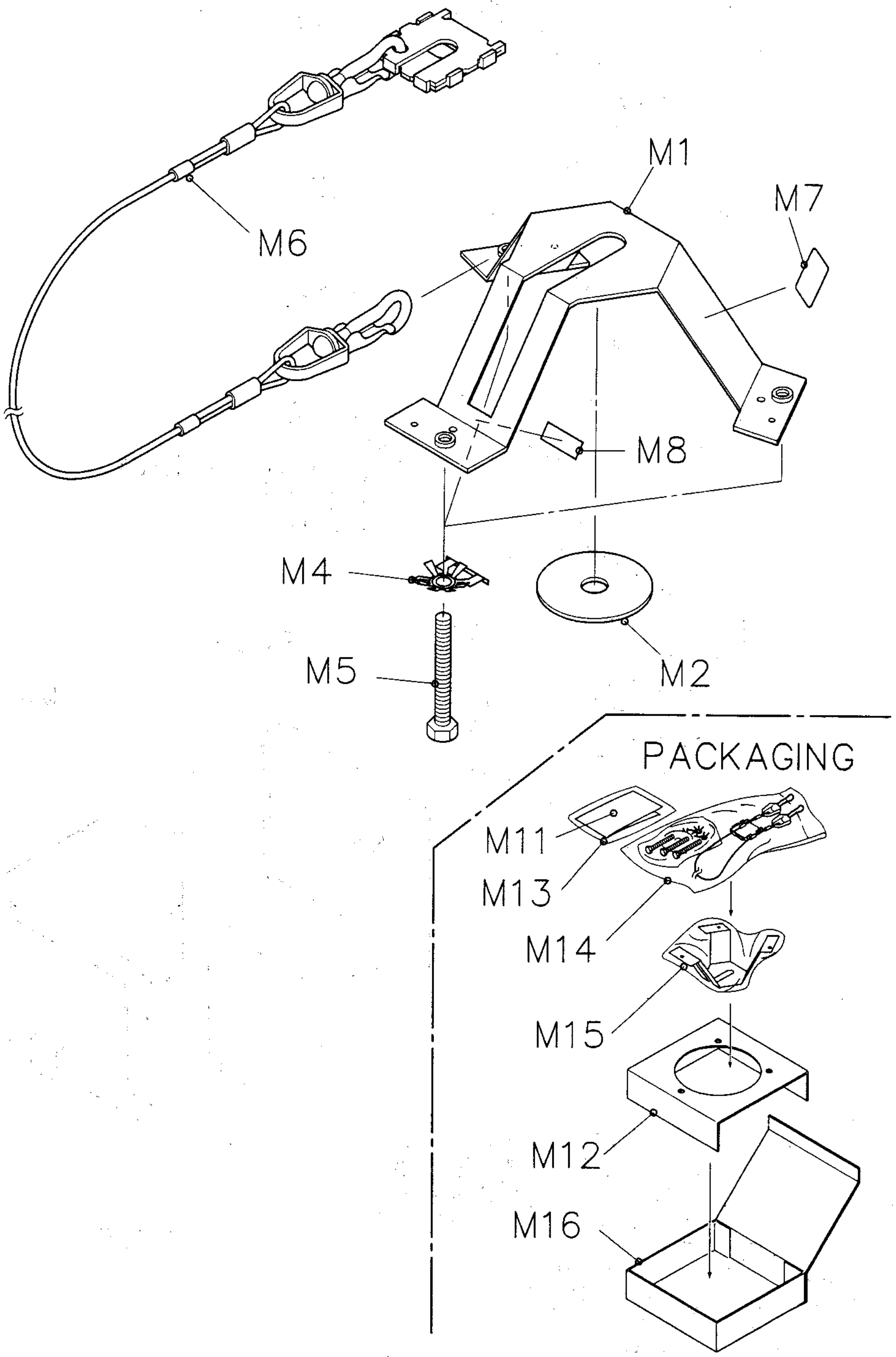
◯ Numbers show screws

No.	Screws	Description
①	XSB26+5FX	Binding Head Screws
②	XYN26+J6FN	Machine Screw and Washer Ass'y
③	TB-308	Special Screw



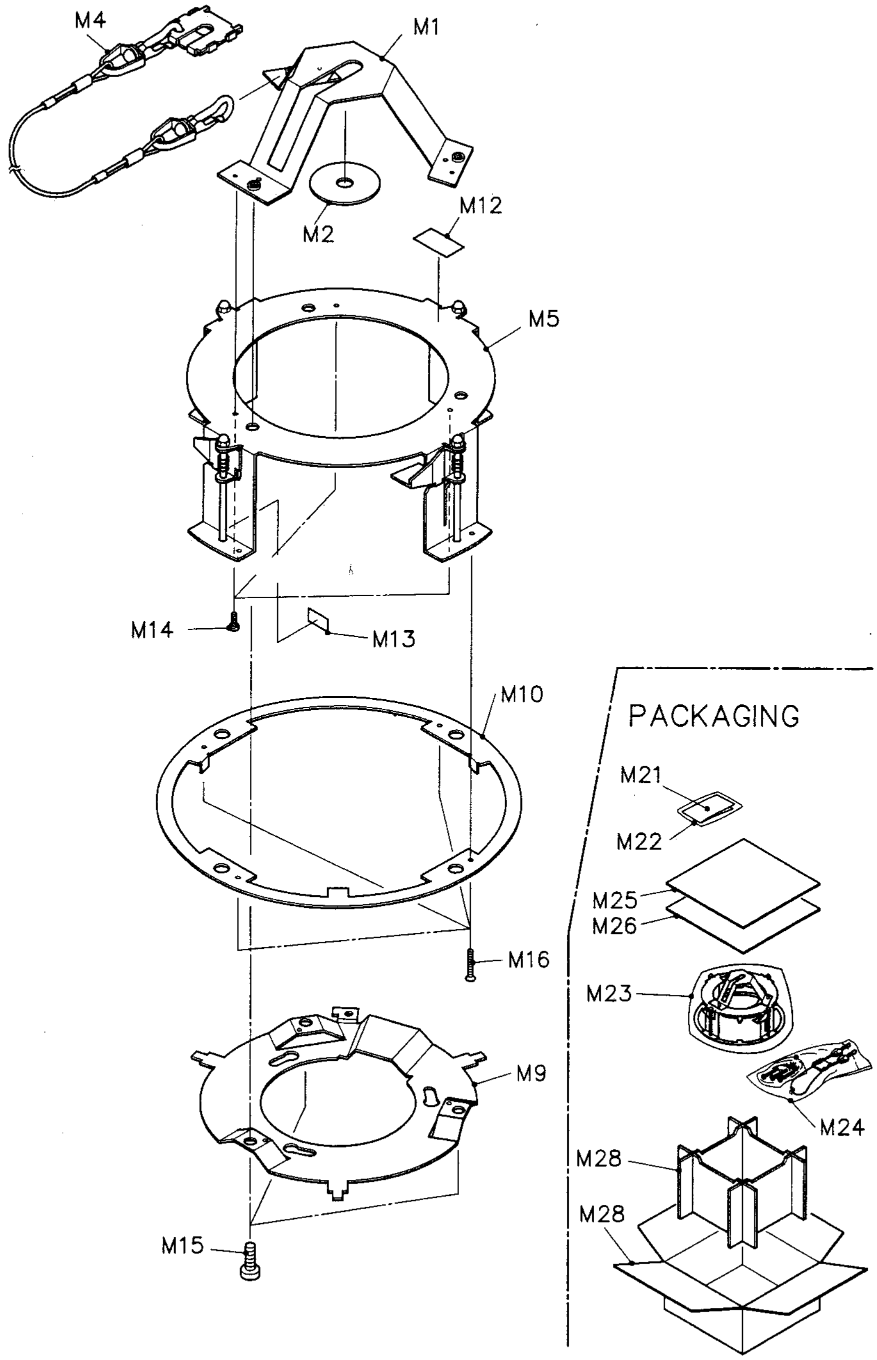
①
M6
PCB4
PCB2
②
E101
①
PCB3
M4
②
①
M5
①
M8
M7
③
①
①
②
①
Q1 01
PCB5
M3
M2

EXPLODED VIEW
CEILING MOUNT BRACKET (WQ-101)


M1
M7
M6
M8
M4
M2
M5
PACKAGING
M11
M13
M14
M15
M12
M16

EXPRODED VIEW

CEILING MOUNT BRACKET (WQ-102)


M4
M1
M12
M2
M5
M14
M13
M10
M16
M9
M15
PACKAGING
M21
M22
M25
M26
M23
M24
M28
M28

REPLACEMENT PARTS LIST

Important Notice

1. Components identified by "⚠" mark have special characteristics important for safety.
   When replacing any of these components, use only manufacturer's specified parts.
2. Printed circuit board assembly with mark (NLA) is no longer available after production discontinuation of the complete set.

COMBINATION CAMERA WV-CS300

MISCELLANEOUS

REF.NO.	PART NO.	DESCRIPTION
Q101	2SB941-PQR	Transistor
Q102	2SA1673-0PY	Transistor
MO1	YWV0EA0200AN	AC Motor Assy
T101 ⚠	YWPHB18V056	Power Transformer
T102 ⚠	YWPHB18V057	Power Transformer
CN100	YWMX5557P04	4-pin Connector
F1 ⚠	XBA2C02ET0A	Current Fuse 0.2A 250V
E101	YWCL320	Flexible Wire Board
E110	YWVCS300L07B	BNC Cable Assy
E111	YWACP104/A	Power Cable Assy for WV-CS300/A
	YWACP104/B	Power Cable Assy for WV-CS300/B
	YWACP104/G	Power Cable Assy for WV-CS300/G
E112	YWCD20YCAP	Insulator Cap for Terminal
M2	YWYPEFD	Lens Assy
M3	YWVAKA0965AN	Head Optical Assy
M4	YWV2SA2144A3	Mounting Angle for Heat Sink
M5	YWV2SA2145B3	Mounting Angle
M6	YWV2SA2146A3	Mounting Angle for Push Board
M7	YWV2SA2147A3	Mounting Angl for Lens
M8	YFV7MA0120A4	Fuse Change Label
M11	YWV9AA0748A4	Mechanical Ass'y
M12	YWV5WA1340A3	Panel
M13	YWV5KA1179A1	Camera Case for Left Side
M14	YWV5KA1180A1	Camera Cover for Right Side
M15	YWV5KA1181A3	Line-Lock Switch Cover
M17	YWV5KA1183A1	Camera Cover for Left Side
M18	YWV5KA1184A1	Pan Tilt Cover
M20	YWV2KA0736B0	Main Chassis
M21	YWV2SA2143A3	Mounting Plate for Camera
M22	YWV4HA0184A4	Shaft
M23	YWV2GA0098A4	Cord Clamp
M24	YWV4FA0039A4	Bearing
M25	YWV0MA0107AN	Pan Shaft Assy
M26	YWV0MA0108AN	Tilt Warm Assy
M27	YWV0MA0109AN	Pan Warm Assy
M29	YWV6GA0202A2	Mounting Base
M30	YWV3FA0144A4	Ring
M31	YWV3FA0145A4	Ring
M32	YWV4JA0408A4	Spring
M33	YWSA1513A4	Front Label
M35	YWV4EA0039B4	Gear
M36	YWV2CA0350B4	Hold Plate
M38	YWV2NA0387A4	Spacer(X4)
M39	YWE5100EM02	Standard Screw
M40	YWV4BA0003A4	Idler
M41	YWV4JA0406A4	Spring
M42	YWV4JA0403A4	Spring
M44	YWV0MA0115AN	Power Case Chassis Assy
M45	YWV2SA2150A4	Mounting Angle Holder for Cable
M46	YWA5RA0366A3	Knob
M47	YWSR5N4	Cord Clamp
M48	YWV2GA0101A3	Cord Clamp
M49	YWV2SA2151A4	Mounting Angle
M50	YWV7MA0404A4	Caution Label
M51	YWV6GA0200A4	Plate
M52	YWV4RA0099A4	Lever(X2)
M53	YWV9AA0752A3	Bottom Plate Assy
M54	YWV3FA0152A4	Spacer
M55	YWV7DA0321A2	Heat Sink
M56	YFV7MA0120A4	Fuse Label
M57	YWV2PA0520A4	Insulater Sheet
M61	YWV5DA0334A4	Ornament
M62	YWV2SA2148A4	Mounting Angle
M63	YWV2SA2149A4	Mounting Angle
M64	YWV0MA0114AN	Lever Assy(X2)
M65	YWV4RA0101A4	Lever(X4)
M66	YWV4JA0405A4	Spring
M67	YWV7MA0237A3	Fuse Rated Label
M68	YWV1EA0238A4	Special Screw
M69	YWV1EA0245A4	Special Screw
M71	YFEDS2	Cord Clamp
M76 ⚠	YWV7QA2770A4	Main Label for WV-CS300/A
	YWV7QA2771A4	Main Label for WV-CS300/B
	YWV7QA2772A4	Main Label for WV-CS300/G
M77	YWV7MA0015A4	Label for WV-CS300/B
M78	YWV7MA0081A4	Safety Label for WV-CS300/B
M79	YWV7SA1487A4	Label
M80	YFV7MB0099A4	Safety Label

DRIVE BOARD

REF.NO.	PART NO.	DESCRIPTION	
PCB2 (NLA)	YWVKBCS30E1A	Printed Circuit Board Assy	
IC1	YWTC7S32FR	IC	
IC2	YWCXA1439M	IC	
IC3	MN53003LBJ	IC	
IC5	NJM2904M	IC	
IC6	YWMB621488U	IC	
IC7	YWUPD16501GS	IC	
IC8,9	MN13821P	IC	
IC10	NJM3414M	IC	
IC14	NJM2904M	IC	
IC20,21	YWTC7S32FR	IC	
Q1	2SC4619	Transistor	
	2SC4627	Transistor	
Q2	2SC4619	Transistor	
	2SC4627	Transistor	
Q3	2SC4619	Transistor	
	2SC4627	Transistor	
Q4	2SC4619	Transistor	
	2SC4627	Transistor	
Q6	2SK662-PQR	Fet	
	2SK853	Transistor	
Q7	2SB766-RS	Transistor	
Q10	2SA1576	Transistor	
	2SB1218-QRS	Transistor	
Q12	2SC4617	Transistor	
	2SD2216	Transistor	
Q13	2SC4617	Transistor	
	2SD2216	Transistor	
Q17	2SA1774	Transistor	
	2SB1462	Transistor	
Q18	2SA1774	Transistor	
	2SB1462	Transistor	
Q19	2SC4617	Transistor	
	2SD2216	Transistor	
Q20	2SC4617	Transistor	
	2SD2216	Transistor	
Q21	2SC4617	Transistor	
	2SD2216	Transistor	
Q22	2SC4617	Transistor	
	2SD2216	Transistor	
Q23	2SA1774	Transistor	
	2SB1462	Transistor	
Q24	2SC4617	Transistor	
	2SD2216	Transistor	
Q27	2SD874-RS	Transistor	
Q30	2SB766-RS	Transistor	
Q33	2SA1774	Transistor	
	2SB1462	Transistor	
Q34	2SA1774	Transistor	
	2SB1462	Transistor	
Q35	2SA1774	Transistor	
	2SB1462	Transistor	
Q36	2SA1774	Transistor	
	2SB1462	Transistor	
Q38	2SC4617	Transistor	
	2SD2216	Transistor	
Q39	2SA1774	Transistor	
	2SB1462	Transistor	
D1	YWDA121	Diode	
	MA132K	Diode	
D2	YWDA221	Diode	
	MA133	Diode	
D4	YWDA221	Diode	
	MA133	Diode	
D5	YWDTZ11	Diode	
	MA8110	Diode	
D6	YWDTZ20	Diode	
	MA8200	Diode	
D7,8	MA372	Diode	
D11	YWDA121	Diode	
	MA132K	Diode	
D12	YWDA121	Diode	
	MA132K	Diode	
R1	ERJ3GEYJ912	Carbon	9.1K ohms 1/16W
R2,3	ERJ3GEYJ911	Carbon	910 ohms 1/16W
R4	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R5,7	ERJ3GEYJ472	Carbon	4.7K ohms 1/16W
R9	ERJ3GEYJ391	Carbon	390 ohms 1/16W
R10	ERJ3GEYJ101	Carbon	100 ohms 1/16W
R11	ERJ3GEYJ221	Carbon	220 ohms 1/16W
R12	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R13	ERJ3GEYJ392	Carbon	3.9K ohms 1/16W
R14	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R15	ERJ3GEYJ331	Carbon	330 ohms 1/16W
R16	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R18	ERJ3GEYJ331	Carbon	330 ohms 1/16W
R21	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R22	ERJ3GEYJ221	Carbon	220 ohms 1/16W
R24	ERJ3GEYJ302	Carbon	3K ohms 1/16W
R26	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R27	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R29	ERJ3GEYJ752	Carbon	7.5K ohms 1/16W
R32	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R33,34	ERJ3GEYJ100	Carbon	10 ohms 1/16W
R36	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R37	ERJ3GEYJ101	Carbon	100 ohms 1/16W
R40,43	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R44,45	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R48	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R49	ERJ3GEYJ101	Carbon	100 ohms 1/16W
R50	ERJ3GEYJ221	Carbon	220 ohms 1/16W
R51,52	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R53	ERJ3GEYJ681	Carbon	680 ohms 1/16W
R54,58	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R61	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R62	YWR0816P153D	Metal	15K ohms

REF.NO.	PART NO.	DESCRIPTION	
R63,66	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R68,70	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R72	YWR0816P302D	Metal	3K ohms 1/16W
R76	ERJ3GEYJ101	Carbon	100 ohms 1/16W
R77	YWR0816P242D	Metal	2.4K ohms 1/16W
R78	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R79	YWR0816P332D	Metal	3.3K ohms 1/16W
R80	YWR0816P222D	Metal	2.2K ohms 1/16W
R82	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R84	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R85	ERJ3GEYJ222	Carbon	2.2K ohms 1/16W
R86	ERJ3GEYJ152	Carbon	1.5K ohms 1/16W
R87,88	ERJ3GEYJ101	Carbon	100 ohms 1/16W
R89	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R90-92	ERJ3GEYJ101	Carbon	100 ohms 1/16W
R94	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R95	ERJ3GEYJ202	Carbon	2K ohms 1/16W
R96	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R99	ERJ3GEYJ243	Carbon	24K ohms 1/16WF
R101	ERJ3GEYJ105	Carbon	1M ohms 1/16W
R104	ERJ3GEYJ104	Carbon	100K ohms 1/16W
R109,112	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R113	ERJ3GEYJ472	Carbon	4.7K ohms 1/16W
R114	ERJ3GEYJ620	Carbon	62 ohms 1/16W
R115	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R116	ERJ3GEYJ332	Carbon	3.3K ohms 1/16W
R117	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R118	YWR0816P302D	Metal	3K ohms
R119	YWR0816P153D	Metal	15Kohms
R120	ERJ3GEYJ152	Carbon	1.5K ohms 1/16W
R121	ERJ3GEYJ100	Carbon	10 ohms 1/16W
R122	ERJ3GEYJ472	Carbon	4.7K ohms 1/16W
R123	ERJ3GEYJ392	Carbon	3.9K ohms 1/16W
R124	YWR0816P472D	Metal	4.7K ohms
R125	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R126	YWR0816P243D	Metal	24K ohms 1/16W
R127	YWR0816P103D	Metal	7K ohms
R130	YWR0816P242D	Metal	2.4K ohms 1/16W
R131	YWR0816P153D	Metal	15Kohms
R134	ERJ3GEYJ104	Carbon	100K ohms 1/16W
R136	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R137	ERJ3GEYJ222	Carbon	2.2K ohms 1/16W
R139	ERJ3GEYJ153	Carbon	15K ohms 1/16W
R140	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R141	ERJ3GEYJ154	Carbon	150K ohms 1/16W
R142	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R143	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R144	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R145,146	YWR0816P103D	Metal	10K ohms
R147	ERJ3GEYJ560	Carbon	56 ohms 1/16W
R148	ERJ3GEYJ472	Carbon	4.7K ohms 1/16W
R153,154	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R155,156	ERJ3GEYJ473	Carbon	47K ohms 1/16W
R159,160	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R163	ERJ3GEYJ470	Carbon	47 ohms 1/16W

REF.NO.	PART NO.	DESCRIPTION	
R164	YWR0816P242D	Metal	2.4K ohms
R165	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R166	ERJ3GEYJ470	Carbon	47 ohms 1/16W
R167	ERJ3GEYJ512	Carbon	5.1K ohms 1/16W
R213	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R214	ERJ3GEYJ682	Carbon	6.8K ohms 1/16W
R215	ERJ3GEYJ222	Carbon	2.2K ohms 1/16W
R216	ERJ3GEYJ682	Carbon	6.8K ohms 1/16W
R217	ERJ3GEYJ101	Carbon	100 ohms 1/16W
R219-221	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R228	ERJ3GEYJ331	Carbon	330 ohms 1/16W
R229	ERJ3GEYJ821	Carbon	820 ohms 1/16W
R231	YWR0816P302D	Metal	3K ohms
R232	YF2116101JT	Carbon	100 ohms 1/16W
R233	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R237,238	ERJ6GEY0R00	Carbon	0 ohms 1/10W
C5,6	YW5CH100J5VB	Ceramic	10 pF
C7	YW5X103K2VB	Ceramic	0.01 µF
C8	YW5SL102K5VB	Ceramic	1000 pF
C9	YW5CH101J5VB	Ceramic	100 pF
C10	YW5CH331J5VB	Ceramic	330 pF
C12	YW5F104Z2VB	Ceramic	0.1 µF
C13	YW5CH331J5VB	Ceramic	330 pF
C14,15	YW5X103K2VB	Ceramic	0.01 µF
C16	YW5CH101J5VB	Ceramic	100 pF
C19	YW5F104Z2VB	Ceramic	0.1 µF
C26	YF400224FZT	Ceramic	0.22 µF
C28	YW5X103K2VB	Ceramic	0.01 µF
C33,35	YF400104FZT	Ceramic	0.1 µF
C36	YF400104FZT	Ceramic	0.1 µF
C37	ECEV1CV470	Electrolytic	47 µF 16V
C38	ECEV1CV100	Electrolytic	10 µF 16V
C39	ECST1VY104ZR	Tantalum	0.1 µF 35V
C40	ECST1DC106	Tantalum	10 µF 20V
C41	ECST1CC106ZR	Tantalum	10 µF 16V
C43	ECEV1CV100	Tantalum	10 µF 16V
C44,45	ECST1CC106ZR	Tantalum	10 µF 16V
C46	ECEV1HV2R2SR	Electrolytic	2.2 µF 50V
C54	ECEV1CV470	Electrolytic	47 µF 16V
C56	ECST1CC106ZR	Tantalum	10 µF 16V
C57	ECST1VD685	Tantalum	6.8 µF 35V
C60	ECEV1CV100	Electrolytic	10 µF 16V
C62	ECEV1HV100SP	Tantalum	10 µF 50V
C63	ECEV1EV220	Electrolytic	22 µF 25V
C68,70	ECEV1CV470	Electrolytic	47 µF 16V
C72	ECST0GY106	Tantalum	10 µF 4V
C74	ECST1CY105ZR	Tantalum	1 µF 16V
C77	YW5F473Z2VB	Ceramic	0.047 µF
C78	YW5X222K5VB	Ceramic	2200 pF
C79,81	YW5F104Z2VB	Ceramic	0.1 µF
C82,83	ECEV1CV100	Electrolytic	10 µF 16V
C95	ECEV1CV470	Electrolytic	47 µF 16V
C103	ECST1AD476ZR	Tantalum	47 µF 10V
C105	YW5CH151J5VB	Ceramic	150 pF
C106	YW5CH101J5VB	Ceramic	100 pF

REF.NO.	PART NO.	DESCRIPTION	
C107	YW5CH120J5VB	Ceramic	12 pF
C114	ECEV1CV470	Electrolytic	47 µF 16V
C115	ECEV1CV100	Electrolytic	10 µF 16V
C117	ECEV1HV4R7SP	Electrolytic	4.7 µF 50V
C118-120	YW5X102K5VB	Ceramic	1000 pF
C123,124	YW5X102K5VB	Ceramic	1000 pF
C138	ECEV1CV470	Tantalum	47 µF 16V
C144	ECEV1EV330	Tantalum	33 µF 25V
L1,5	ELJFC8R2MF	Coil	8.2 µH
L6,10	ELJFC8R2MF	Coil	8.2 µH
L12	EIC4EJ004E	Coil	
L15,18	ELJFC8R2MF	Coil	8.2µH
L21	YWCD75391KC	Coil	390 µH
L22	YWNL32T221K	Coil	220 µH
CF1	ELB4B532	Filter	
CN1	YW523961490	14-pin Connector	
CN2	YW522051890	18-pin Connector	
CN3	YW522051490	14-pin Connector	
CN4	YW31756356	16-pin Connector	
CN7	YW522051890	18-pin Connector	
CN8,9	YW71756436	16-pin Connector	
TP1	YWRCT2125TPV	Test Point	

DIGITAL BOARD

REF.NO.	PART NO.	DESCRIPTION
PCB3 (NLA)	YWVKCCS30E1A	Printed Circuit Board Assy
IC1	AN2015FAP	IC
IC2,3	NJM4558M	IC
IC6	YWCXD1175AM	IC
IC7	YWM6M80021FP	IC
IC8	MN6730FHP	IC
IC9	MN6731FHP	IC
IC10	MN188166CUA	IC
IC12	MN65701FHP	IC
IC13	MN53020LB01	IC
Q8	2SC4617	Transistor or
	2SD2216	Transistor
Q9	2SA1774	Transistor or
	2SB1462	Transistor
Q10	2SA1774	Transistor or
	2SB1462	Transistor
Q11	2SC4617	Transistor or
	2SD2216	Transistor
Q14	2SC4617	Transistor or
	2SD2216	Transistor
Q15	2SC4617	Transistor or
	2SD2216	Transistor
Q16	2SC4617	Transistor or
	2SD2216	Transistor
Q17	2SC4617	Transistor or
	2SD2216	Transistor

REF.NO.	PART NO.	DESCRIPTION	
Q18-22	FA3L4ZT1B	Transistor	
Q26	2SA1774	Transistor or	
	2SB1462	Transistor	
Q27	2SC4617	Transistor or	
	2SD2216	Transistor	
D2	YWDA221	Diode or	
	MA133	Diode	
D3	YWDA221	Diode or	
	MA133	Diode	
D4	YWDA221	Diode or	
	MA133	Diode	
TH215	L311F431J502	Thermistor	
R9	ERJ3GEYJ392	Carbon	3.9K ohms 1/16W
R19	ERJ3GEYJ473	Carbon	47K ohms 1/16W
R20	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R21	ERJ3GEYJ332	Carbon	3.3K ohms 1/16W
R23	ERJ3GEYJ112	Carbon	1.1K ohms 1/16W
R25	ERJ3GEYJ332	Carbon	3.3K ohms 1/16W
R28	ERJ3GEYJ391	Carbon	390 ohms 1/16W
R30	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R31	ERJ3GEYJ272	Carbon	2.7K ohms 1/16W
R33	ERJ3GEYJ152	Carbon	1.5K ohms 1/16W
R34,36	ERJ3GEYJ682	Carbon	6.8K ohms 1/16W
R37	ERJ3GEYJ222	Carbon	2.2K ohms 1/16W
R38-41	ERJ3GEYJ682	Carbon	6.8K ohms 1/16W
R42-44	ERJ3GEYJ122	Carbon	1.2K ohms 1/16W
R45,46	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R47	ERJ3GEYJ122	Carbon	1.2K ohms 1/16W
R48	ERJ3GEYJ101	Carbon	100 ohms 1/16W
R50	ERJ3GEYJ122	Carbon	1.2K ohms 1/16W
R53	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R56	ERJ3GEYJ101	Carbon	100 ohms 1/16W
R58,59	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R68,69	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R72,73	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R76	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R77	ERJ3GEYJ100	Carbon	10 ohms 1/16W
R78,79	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R82,85	ERJ3GEYJ472	Carbon	4.7K ohms 1/16W
R94	ERJ3GEYJ472	Carbon	4.7K ohms 1/16W
R95	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R96	YWR0816P221D	Metal	220 ohms
R97	YWR0816P102D	Metal	1K ohms
R98	YWR0816Q560D	Metal	5.6K ohms
R99	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R100,101	YWR0816P221D	Metal	220 ohms
R104	YWR0816P472D	Metal	4.7K ohms
R105	YWR0816P562D	Metal	5.6K ohms
R106,113	ERJ3GEYJ472	Carbon	4.7K ohms 1/16W
R114	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R115	ERJ3GEYJ472	Carbon	4.7K ohms 1/16W
R116	ERJ3GEYJ271	Carbon	270 ohms 1/16W
R117	ERJ3GEYJ472	Carbon	4.7K ohms 1/16W
R118-120	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R122	ERJ3GEY0R00	Carbon	0 ohms 1/16W

REF.NO.	PART NO.	DESCRIPTION	
R123	ERJ3GEYJ105	Carbon	1M ohms 1/16W
R133,136	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R137-148	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R150-157	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R158	ERJ3GEYJ122	Carbon	1.2K ohms 1/16W
R159	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R160	ERJ3GEYJ122	Carbon	1.2K ohms 1/16W
R161	ERJ3GEYJ682	Carbon	6.8K ohms 1/16W
R162	ERJ3GEYJ122	Carbon	1.2K ohms 1/16W
R163,164	ERJ3GEYJ682	Carbon	6.8K ohms 1/16W
R168-180	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R184,185	ERJ3GEYJ473	Carbon	47K ohms 1/16W
R186	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R187	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R188	ERJ3GEYJ392	Carbon	3.9K ohms 1/16W
R189	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R190	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R191	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R192	ERJ3GEYJ562	Carbon	5.6K ohms 1/16W
R193	ERJ3GEYJ821	Carbon	820 ohms 1/16W
R194	ERJ3GEYJ562	Carbon	5.6K ohms 1/16W
R196	ERJ3GEYJ2R2	Carbon	2.2 ohms 1/16W
R197	ERJ3GEYJ221	Carbon	220 ohms 1/16W
R198	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R199	ERJ3GEYJ181	Carbon	180 ohms 1/16W
R201,204	ERJ6GEY0R00	Carbon	1 ohms 1/10W
R205-213	ERJ6GEY0R00	Carbon	1 ohms 1/10W
R214	ERJ3GEYJ104	Carbon	100K ohms 1/16W
Z1-6	EXBV8V470J	Block Resistor	
C3	YW5F473Z2VB	Ceramic	0.047 µF
C6-8	YW5CH120J5VB	Ceramic	12 pF
C9	YW5CH151J5VB	Ceramic	150 pF
C10	YW5CH101J5VB	Ceramic	100 pF
C12	YW5CH120J5VB	Ceramic	12 pF
C15	YW5CH330J5VB	Ceramic	33 pF
C16	YW5CH151J5VB	Ceramic	150 pF
C17	YW5X102K5VB	Ceramic	1000 pF
C18	YW5CH120J5VB	Ceramic	12 pF
C20	YW5CH150J5VB	Ceramic	15 pF
C21	YW5CH101J5VB	Ceramic	100 pF
C22	YW5CH151J5VB	Ceramic	150 pF
C23	YW5F104Z2VB	Ceramic	0.1 µF
C27,29	YW5CH101J5VB	Ceramic	100 pF
C32,35	YW5F104Z2VB	Ceramic	0.1 µF
C36	YW400474FZ	Ceramic	0.47 µF
C37	YW5F104Z2VB	Ceramic	0.1 µF
C38-40	YW5CH120J5VB	Ceramic	12 pF
C45	YW5F104Z2VB	Ceramic	0.1 µF
C46,47	YF400104FZT	Ceramic	0.1 µF
C48	ECST0JY335	Tantalum	3.3/6.3V
C49,50	YF400103XKT	Ceramic	0.01 µF
C56	ECST0JY475	Tantalum	4.7 µF 6.3V
C57	ECST0JY685	Tantalum	6.8 µF 6.3V
C58	ECST1AB106	Tantalum	10 µF 10V
C59	ECST0GB226ZR	Tantalum	22 µF 4V

REF.NO.	PART NO.	DESCRIPTION	
C60	ECST0JY475	Tantalum	4.7 µF 6.3V
C61	ECST0GY475Z	Tantalum	4.7 µF 4V
C62	ECST1DC685ZR	Tantalum	6.8 µF 20V
C63	ECST1CB475ZR	Tantalum	4.7 µF 16V
C64	ECST1AD476ZR	Tantalum	47 µF 10V
C65	ECST1VY104ZR	Tantalum	0.1 µF 35V
C67	ECST1AC106	Tantalum	10 µF 10V
C69	ECST1AB106	Tantalum	10 µF 10V
C70	ECST0GY106	Tantalum	10 µF 4V
C71	ECST1AB106	Tantalum	10 µF 10V
C72	ECST1CC106ZR	Tantalum	10 µF 16V
C73,75	ECST1AC106	Tantalum	10 µF 10V
C77,78	ECST1AC106	Tantalum	10 µF 10V
C80	ECST1AC106	Tantalum	10 µF 10V
C82	ECEV1CV100	Electrolytic	10 µF 16V
C83	ECST1AC106	Tantalum	10 µF 10V
C84-86	ECST1AC226	Tantalum	22 µF 10V
C87	ECST0JB106ZR	Tantalum	10 µF 6.3V
C88	ECST1AC106	Tantalum	10 µF 10V
C90,91	ECST1AB106	Tantalum	10 µF 10V
C92	ECST1AD476ZR	Tantalum	47 µF 10V
C93	YW5F104Z2VB	Ceramic	0.1 µF
C96	ECST1AY475	Tantalum	4.7 µF 10V
C160	YW5CH200J5VB	Ceramic	20 pF
L1,2	ELJFC8R2MF	Coil	8.2 µH
L4,7	ELJFC8R2MF	Coil	8.2 µH
L8,10	ELJFC8R2MF	Coil	8.2 µH
L11,13	ELJFC8R2MF	Coil	8.2 µH
L14,25	ELJFC8R2MF	Coil	8.2 µH
L30	ELJFC8R2MF	Coil	8.2 µH
X1	EF0V8004E0A	Crystal Oscillator	
CF4	ELB4A512	Filter	
CF5	EIK4EW001T	Filter	
CF6	EIK4EW002T	Filter	
CN1,2	YW71756436	16-pin Connector	
CN3,4	YW523961890	18-pin Connector	
CN5,6	YW31756316	6-pin Connector	

SYNC/ENCODER BOARD

REF.NO.	PART NO.	DESCRIPTION	
PCB4 (NLA)	YWVKDCS30E1A	Printed Circuit Board Assy	
IC4	AN2254FAP	LSI	
IC5	YWM62352GP	IC	
IC7	MN73069LBM2	IC	
IC8	NJM2903M	IC	
IC9	YWTC7S32FR	IC	
IC10	YWTC4S69F	IC	
IC11,12	YWTC7S04F	IC	
Q1,2	2SK853	Transistor	
Q3	2SK662-PQR	FET	
Q7	2SK853	Transistor	
Q10,11	2SA1774	Transistor or	
	2SB1462	Transistor	
Q29	2SC4617	Transistor or	
	2SD2216	Transistor	
Q45	UMX1	Transistor or	
	XP4501	Transistor	
Q46	2SC4617	Transistor or	
	2SD2216	Transistor	
Q47,48	2SA1774	Transistor or	
	2SB1462	Transistor	
Q49	2SC4617	Transistor or	
	2SD2216	Transistor	
Q50	UMZ1	Transistor or	
	XP4601	Transistor	
D1	YWDA120	Diode or	
	MA132A	Diode	
D2-7	MA372	Diode	
D8,9	MA729	Diode	
D10,11	YWDA120	Diode or	
	MA132A	Diode	
R1	ERJ3GEYJ222	Carbon	2.2K ohms 1/16W
R3	ERJ3GEYJ183	Carbon	18K ohms 1/16W
R4	ERJ3GEYJ822	Carbon	8.2K ohms 1/16W
R6	ERJ3GEYJ221	Carbon	220 ohms 1/16W
R7	ERJ3GEYJ332	Carbon	3.3K ohms 1/16W
R8	ERJ3GEYJ224	Carbon	220K ohms 1/16W
R9	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R10	ERJ3GEYJ105	Carbon	1M ohms 1/16W
R11,12	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R13	ERJ3GEYJ333	Carbon	33K ohms 1/16W
R15,16	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R17	ERJ3GEYJ333	Carbon	33K ohms 1/16W
R18	ERJ3GEYJ184	Carbon	180K ohms 1/16W
R19	ERJ3GEYJ223	Carbon	22K ohms 1/16W
R21-24	ERJ3GEYJ333	Carbon	33K ohms 1/16W
R27	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R28,29	ERJ3GEYJ101	Carbon	100 ohms 1/16W
R30	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R32	ERJ3GEYJ332	Carbon	3.3K ohms 1/16W
R33	ERJ3GEYJ511	Carbon	510 ohms 1/16W
R34	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R35	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R37	ERJ3GEYJ561	Carbon	560 ohms 1/16W
R39	ERJ3GEYJ332	Carbon	3.3K ohms 1/16W
R41,43	ERJ3GEYJ221	Carbon	220 ohms 1/16W
R44	ERJ3GEYJ822	Carbon	8.2K ohms 1/16W
R45,46	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R47	ERJ3GEYJ221	Carbon	220 ohms 1/16W
R48,50	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R51,52	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R56	ERJ3GEYJ334	Carbon	330K 1/16W
R58	ERJ3GEYJ332	Carbon	3.3K ohms 1/16W
R59	ERJ3GEYJ104	Carbon	100K ohms 1/16W
R62	ERJ3GEYJ105	Carbon	1M ohms 1/16W
R63	ERJ3GEYJ823	Carbon	82K ohms 1/16W
R66,67	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R70	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R71	ERJ3GEYJ105	Carbon	1M ohms 1/16W
R73	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R74,75	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R77	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R79	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R80	YWR0816P331D	Metal	330 ohms
R82	ERJ3GEYJ561	Carbon	560 ohms 1/16W
R83	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R84	YWR0816P681D	Metal	680 ohms
R85	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R86	ERJ3GEYJ334	Carbon	330K 1/16W
R88	ERJ3GEYJ272	Carbon	2.7K ohms 1/16W
R89	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R90	ERJ3GEYJ113	Carbon	11K ohms 1/16W
R91	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R92	ERJ3GEYJ912	Carbon	9.1K ohms 1/16W
R95	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R97	ERJ3GEYJ222	Carbon	2.2K ohms 1/16W
R102	ERJ3GEYJ153	Carbon	15K ohms 1/16W
R103	ERJ3GEYJ391	Carbon	390 ohms 1/16W
R107	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R110	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R112	ERJ3GEYJ562	Carbon	5.6K ohms 1/16W
R113	ERJ3GEYJ153	Carbon	15K ohms 1/16W
R120,123	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R124,129	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R132	YF2116431JT	Carbon	430 ohms 1/16W
R144	ERJ3GEYJ223	Carbon	22K ohms 1/16W
R148	ERJ3GEYJ752	Carbon	7.5K ohms 1/16W
R163	ERJ3GEYJ101	Carbon	100 ohms 1/16W
R166	ERJ3GEYJ561	Carbon	560 ohms 1/16W
R167	ERJ3GEYJ222	Carbon	2.2K ohms 1/16W
R168	ERJ3GEYJ202	Carbon	2K ohms 1/16W
R170	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R176,179	YWR0816P471D	Metal	470 ohms
R182	YWR0816P302D	Metal	3K ohms
R183	YWR0816P751D	Metal	750 ohms

REF.NO.	PART NO.	DESCRIPTION	
R187	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R188	ERJ3GEYJ392	Carbon	3.9K ohms 1/16W
R189	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R190	ERJ3GEYJ393	Carbon	39K ohms 1/16W
R191	ERJ3GEYJ392	Carbon	3.9K ohms 1/16W
R192	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R193	ERJ3GEYJ392	Carbon	3.9K ohms 1/16W
R194	ERJ3GEYJ393	Carbon	39K ohms 1/16W
R195	ERJ3GEYJ392	Carbon	3.9K ohms 1/16W
R196	ERJ3GEYJ113	Carbon	11K ohms 1/16W
R198	ERJ3GEYJ101	Carbon	100 ohms 1/16W
R199,200	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R203	ERJ3GEYJ152	Carbon	1.5K ohms 1/16W
R204	ERJ3GEYJ222	Carbon	2.2K ohms 1/16W
R205	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R206,210	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R212	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R213	ERJ3GEYJ104	Carbon	100K ohms 1/16W
R214,215	ERJ3GEYJ332	Carbon	3.3K ohms 1/16W
R216	ERJ3GEYJ151	Carbon	150 ohms 1/16W
R217	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R218	ERJ3GEYJ221	Carbon	220 ohms 1/16W
R219	ERJ3GEYJ751	Carbon	750 ohms 1/16W
R220,221	ERJ6GEY0R00	Carbon	1 ohms 1/10W
C1	YF400104FZT	Ceramic	0.1 F
C2	YW5CH120J5VB	Ceramic	12 pF
C3	YW5X122K5VB	Ceramic	1200 pF
C4,5	YW5CH151J5VB	Ceramic	150 pF
C6	YW5F104Z2VB	Ceramic	0.1 μF
C7	YW5CH121J5VB	Ceramic	120 pF
C8	YW5X103K2VB	Ceramic	0.01 μF
C9	YW5CH910J5VB	Ceramic	
C10	YW5CH750J5VB	Ceramic	75 pF
C11,12	YF400104FZT	Ceramic	0.1 μF
C17	YW5CH331J5VB	Ceramic	330 pF
C18	YW5F104Z2VB	Ceramic	0.1 μF
C19	YF400104FZT	Ceramic	0.1 μF
C21	YW5CH271J5VB	Ceramic	270 pF
C22	YW5CH331J5VB	Ceramic	330 pF
C23	YW5CH271J5VB	Ceramic	270 pF
C24,25	YW5X103K2VB	Ceramic	0.01 μF
C26	YW5CH270J5VB	Ceramic	27 pF
C28	YW5X103K2VB	Ceramic	0.01 μF
C32,33	YF426104XKS	Ceramic	0.1 μF
C34,35	YW5F104Z2VB	Ceramic	0.1 μF
C45	YW5X103K2VB	Ceramic	0.01 μF
C46	YW400393XKT	Ceramic	0.039 μF
C47-52	YF400104FZT	Ceramic	0.1 μF
C53	ECST0JY335	Electrolytic	3.3 μF 6.3V
C54,56	YF400104FZT	Ceramic	0.1 μF
C62	YW400393XKT	Ceramic	0.039 μF
C64,66	ECST1AC106	Electrolytic	10 μF 10V
C67	ECEV1EV220	Electrolytic	22 μF 25V
C69	ECST0JB106ZR	Electrolytic	10 μF 6.3V
C71	ECST1AC156	Electrolytic	15 μF 10V

REF.NO.	PART NO.	DESCRIPTION	
C73	ECST1AC106	Electrolytic	10 μF 10V
C74	ECST1CY105ZR	Electrolytic	1 μF 16V
C75	ECST1AY225ZR	Electrolytic	2.2 μF 10V
C76	ECST1AC156	Electrolytic	15 μF 10V
C77	ECST1VY224Z	Electrolytic	0.22 μF 35V
C78	ECST1AC156	Electrolytic	15 μF 10V
C79	ECST0GC336ZR	Electrolytic	33 μF 4V
C81,82	ECST1CC106ZR	Electrolytic	10 μF 16V
C83	ECEV1CV100	Electrolytic	10 μF 16V
C86	YW5CH101J5VB	Ceramic	100 pF
C87	YW5F104Z2VB	Ceramic	0.1 μF
C88	ECEV1CV100	Electrolytic	10 μF 16V
C89	ECST1CY105ZR	Electrolytic	1 μF 16V
C90	YW5F104Z2VB	Ceramic	0.1 μF
C92	ECST1CY105ZR	Electrolytic	1 μF 16V
C93	ECEV1CV100	Electrolytic	10 μF 16V
C94	ECST1ED106ZR	Electrolytic	10 μF 25V
C95,97	ECEV1CV470	Electrolytic	47 μF 16V
C98	YF400224FZT	Ceramic	0.22 μF
C99	YW5F104Z2VB	Ceramic	0.1 μF
C100	YW5CH221J5VB	Ceramic	220 pF
L1	ELJFC8R2MF	Coil	8.2 μH
L5	EIC4EJ003E	Coil	
L7,8	ELJFC8R2MF	Coil	8.2 μH
L10,11	ELJFC8R2MF	Coil	8.2 μH
X1	YWDX17R734	Crystal Oscillator	
X2	YWDX14R187	Crystal Oscillator	
CF3	ELB4D537	Filter	
CF6	YWNL4532S4R4	Filter	
TP1-3	YWRCT2125TPV	Test Point	
TP7	YWRCT2125TPV	Test Point	
CN1,2	YW41756386	16-pin Connector	
CN3	YW523961490	14-pin Connector	

POWER BOARD

REF.NO.	PART NO.	DESCRIPTION	
PCB5 (NLA)	YWVKYCS30P2A	Pronted Circuit BoardAssy	
IC1	YWM5237MLT1	IC	
IC2	YWTC4S11F	IC	
Q1	2SK612	FET	
D2,3	YWF1H4TP	Diode	
R1	ERJ3GEYJ221	Carbon	220 ohms 1/16W
R2	ERJ3GEYJ471	Carbon	470 ohms 1/16W
R3	ERJ3GEYJ223	Carbon	22K ohms 1/16W
R4	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R6	ERJ3GEYJ332	Carbon	3.3K ohms 1/16W
R20	ERJ3GEYJ104	Carbon	100K ohms 1/16W
R50,51	ERJ3GEYJ333	Carbon	33K ohms 1/16W
VR1	EVM7JSW30B53	Variable Resistor	5K ohms
C1	YW5X102K5VB	Ceramic	1000 pF
C2	ECQV1H104JZ	Plastic	0.1 μF 50V

REF.NO.	PART NO.	DESCRIPTION
C3	YW5F104Z2VB	Ceramic 0.1 µF
C5	YW400A123XKS	Ceramic 0.1 µF
C6,7	ECEA1CGE101	Electrolytic 100 µF 16V
C9	ECEA1AGE221	Electrolytic 220 µF 10V
C11	ECEA1EGE101	Electrolytic 100 µF 25V
C12	ECEA1AFS331	Electrolytic 100 µF 10V
C50	YW5F104Z2VB	Ceramic 0.1 µF
C51,52	ECEA0JGE331	Electrolytic 330 µF 10V
C53	ECEA0JGE471	Electrolytic 470 µF 10V
C54	ECKF1H222MD	Ceramic 2200 pF 50V
L1	YW664D101K	Coil 100 µH
T1 ⚠	ETE11K10AY	Power Transformer
SW50	YWSSS912L2NH	Slide Switch
SW51	YWSSS912L4NH	Slide Switch
F1 ⚠	YWSSFR1A	Current Fuse 1A 125V
CN2,3	YW11746356	16-pin Connector
CN4	YWS3BPHKS	3-pin Connector
CN5	YW530150610	6-pin Connector
TP1	YWRCT2125TPV	Test Point

CONTROL BOARD

REF.NO.	PART NO.	DESCRIPTION
PCB6 (NLA)	YWVKBCS30P2A	Printed Circuit Board Assy
IC1	M5237ML	IC
IC2	YW78L05UATE1	IC
IC3	YWM51957BFP	IC
IC4	YWHD74HC673P	IC
IC5	YWMC74HC08F	IC
IC6	YWMC74HC32F	IC
IC7	YWMC74HC04F	IC
IC8	YWMC74HC14F	IC
IC9	YWSC7S04F	IC
IC10	NJM2901M	IC
IC11	YWLB1648	IC
Q1-4	DTC114YU	Transistor
Q5	DTA114YU	Transistor
Q6	DTC114YU	Transistor
D1	YWRBA406B	Diode
D3	MA8068	Diode
D4	MA8047	Diode
SCR1-4	YWS16MD01	Thyristor
R1	ERJ14YJ510	Carbon 51 ohms 1/4W
R2	ERJ3GEYG822	Metal 8.2K ohms
R3	ERJ3GEYG332	Metal 3.3K ohms
R4-7	ERJ14YJ561	Carbon 560 ohms
R12	ERJ12YK5R6	Carbon 5.6 ohms
R13	ERJ6GEYJ221	Carbon 220 ohms
R14	ERJ3GEYJ102	Carbon 1K ohms 1/16W
R15	ERJ3GEYJ562	Carbon 5.6K ohms 1/16W
R16	ERJ6GEYJ103	Carbon 10K ohms 1/10W
R17-24	ERJ3GEYJ222	Carbon 2.2K ohms 1/16W
R25	ERJ3GEYJ103	Carbon 10K ohms 1/16W
R26	ERJ3GEYJ474	Carbon 470K ohms 1/16W
R27,28	ERJ3GEYJ103	Carbon 10K ohms 1/16W
R29	ERJ3GEYJ474	Carbon 470K ohms 1/16W
R30,31	ERJ3GEYJ103	Carbon 10K ohms 1/16W
R32	ERJ3GEYJ474	Carbon 470K ohms 1/16W
R33,34	ERJ3GEYJ103	Carbon 10K ohms 1/16W
R35	ERJ3GEYJ474	Carbon 470K ohms 1/16W
R36	ERJ3GEYJ103	Carbon 10K ohms 1/16W
R37,38	ERJ3GEYJ102	Carbon 1K ohms 1/16W
R39-41	ERJ3GEYJ682	Carbon 6.8K ohms 1/16W
VR1	EVM1DSW30BY3	Variable Resistor 3.3K ohms
Z1	EXBV8V332J	Block Resistor
Z2,3	EXBV8V103J	Block Resistor
Z4	EXBV8V102J	Block Resistor
Z5	EXBV8V104J	Block Resistor
C1	ECOS1EA472BA	Electrolytic
C2	ECQM1H334KZ	Plastic 0.33 µF
C3	ECST1CX475ZR	Tantalum 4.7 µF 16V
C4	ECEV1CV470	Electrolytic 47 µF 16V
C5,6	YW5F104Z2VB	Ceramic 0.1 µF
C7	ECEV1CV470	Electrolytic 47 µF 16V
C8	ECEV0JV101	Electrolytic 100 µF 6.3V
C9,10	YW5F104Z2VB	Ceramic 0.1 µF
C11-14	YW5CH221J5VB	Ceramic 220 pF
C15-20	YW5F104Z2VB	Ceramic 0.1 µF
C21	ECEV1CV470	Electrolytic 47 µF 16V
C22-31	YW5F104Z2VB	Ceramic 0.1 µF
C32,33	ECQE1395JF	Plastic 3.9 µF
C38	ECQV1H104JZ	Plastic 0.1 µF 50V
L1-3	YWNL32T221K	Coil 220 µH
L4	YWNL32100K	Coil 10 µH
L5	YWNL32330K	Coil 33µH
F1	YWSSFR1AF002	Current Fuse 1A 125V
CN1	S5PS2T2EF	5-pin Connector
CN3,4	S4PS2T2EF	4-pin Connector
CN5,6	YW530470410	4-pin Connector
CN7	YW530471010	10-pin Connector
CN9	YW530140310	3-pin Connector

PAN-LIMIT BOARD

REF.NO.	PART NO.	DESCRIPTION
PCB7 (NLA)	YWVKCCS30P2A	Printed Circuit Board Assy
IC100,101	YWEW450FT	IC
C100,101	YW5F104Z2VB	Ceramic 0.1 µF
CN100	YW530480410	4-pin Connector

REF.NO.	PART NO.	DESCRIPTION
TILT-LIMIT BOARD		
PCB8 (NLA)	YWVKDCS30P2A	Printed Circuit Board Assy
IC102,103	YWEW450FT	IC
C102,103	YW5F104Z2VB	Ceramic 0.1 µF
CN101	YW530480410	4-pin Connector
LED BOARD		
PCB9 (NLA)	YWVKECS30J2A	Printed Circuit Board Assy
D100	LN086WP38	LED
SW100	YWSSSS212A	Slide Switch
POWER SWITCH BOARD		
PCB10 (NLA)	YWVKBCS30P3A	Printed Circuit Board Assy
VS5	ERZC03DK390	Znr
SW1	ESB70902V	Rotary Switch
E1	YWF60ACF	Fuse Holder
CN1	YWPP120	Terminal
CN2	S2PS2T2EF	2-pin Connector
CN3	S5PS2T2EF	5-pin Connector
CN4,5	YWB2PVH	2-pin Connector
M81	YWV2SA2152A4	Switch Mounting Angle
M82	YWV2PA0500A4	Switch Insulator Cover
FILTER BOARD		
PCB11 (NLA)	YWVKCCS30E3A	Printed Circuit Board Assy
VS1-3	ERZC14DK471	Varistor
VS4	YWDSA302MA	Varistor
C1,2	ECKDRS103ZV	Ceramic 0.01 µF
C3-6	ECKDRS332ME	Ceramic 3300 pF
L1	ELF18D227F	Line Filter
CN6-8	YWB2P3VH	2-pin Connector
E1	YW851040	Insulator
E2	YWCAP170A	Internal

REF.NO.	PART NO.	DESCRIPTION
RECIEVER BOARD		
PCB12 (NLA)	YWVKZCS30E1A	Printed Circuit Board Assy
IC1,2	YWMC74HC02AF	IC
IC3	YWMC14069UBF	IC
IC4	YWCF37808PG	LSI
IC5	YWD75116FF10	IC
IC6	YWMC14081BF	IC
IC7	YWTC4S69F	IC
IC8	YWS24S30IF	IC
IC9	YWM5295L	IC
IC10	YWTC7S32FL	IC
IC11	NJM78L05A	IC
IC12	YWMC74HC08AF	IC
Q1	2SA1037-QRS	Transistor
Q2	DTC114EU	Transistor
Q3	2SB909	Transistor
Q4-6	2SC2412-QRS	Transistor
Q7	2SA1576	Transistor
Q8,9	2SA1037-QRS	Transistor
Q12	2SA1576	Transistor
Q13	2SC3802	Transistor
Q14	2SA1733	Transistor
Q15,16	2SC4081	Transistor
Q17	IMZ1T9	Transistor
Q19	2SA1576	Transistor
Q20	IMT1T10	Transistor
Q22	IMX3T9	Transistor
Q24	2SC2412-QRS	Transistor
Q26	2SA1576	Transistor
Q27	IMZ1T9	Transistor
Q29	2SC4081	Transistor
Q30	2SC4776	Transistor
Q31	2SA937	Transistor
Q32,34	IMZ1T9	Transistor
Q36	IMX3T9	Transistor
Q37	2SC3802	Transistor
Q39,41	IMZ1T9	Transistor
Q43	IMX3T9	Transistor
Q45	IMZ1T9	Transistor
Q47,48	2SC4776	Transistor
Q49	IMX3T9	Transistor
Q51	IMZ1T9	Transistor
Q53	2SC4081	Transistor
Q56,58	IMZ1T9	Transistor
D1	YWDA114	Diode
D2	YWSLH38DC	Diode
D3	SLH38MC	LED(Green)
D6,7	YWDA114	Diode
D11	YWDA114	Diode
D12,16	YWDAN202U	Diode
D23	YWDA114	Diode

REF.NO.	PART NO.	DESCRIPTION	
D24,26	YWDAN202U	Diode	
D28-30	YWDA114	Diode	
D31	YWDAN202U	Diode	
D33-38	YWDA114	Diode	
R1	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R2,5	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R6	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R7	ERJ3GEYJ472	Carbon	4.7K ohms 1/16W
R8	YF2116471JT	Carbon	470 ohms 1/16W
R9,10	YF2116681JT	Carbon	680 ohms 1/16W
R11,12	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R13	YF2116681JT	Carbon	680 ohms 1/16W
R14,15	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R16	ERJ3GEYJ472	Carbon	4.7K ohms 1/16W
R17	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R18,19	ERJ3GEYJ333	Carbon	33K ohms 1/16W
R22-24	ERJ3GEYJ333	Carbon	33K ohms 1/16W
R26-35	ERJ3GEYJ333	Carbon	33K ohms 1/16W
R36	ERJ3GEYJ101	Carbon	100 ohms 1/16W
R37	ERJ3GEYJ105	Carbon	1M ohms 1/16W
R38	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R39	ERJ3GEYJ101	Carbon	100 ohms 1/16W
R40	ERJ3GEYJ333	Carbon	33K ohms 1/16W
R41	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R42	ERJ3GEYJ472	Carbon	4.7K ohms 1/16W
R43	ERJ3GEYJ223	Carbon	22K ohms 1/16W
R44	ERJ3GEYJ273	Carbon	27K ohms 1/16W
R45	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R51-53	ERJ3GEYJ333	Carbon	33K ohms 1/16W
R56-59	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R60	ERJ6GEYJ223	Carbon	22K ohms 1/10W
R61	ERJ3GEYJ223	Carbon	22K ohms 1/16W
R62	ERJ3GEYJ560	Carbon	56 ohms 1/16W
R63	ERJ3GEYJ223	Carbon	22K ohms 1/16W
R64	ERJ3GEYJ682	Carbon	6.8K ohms 1/16W
R65	ERJ3GEYJ332	Carbon	3.3K ohms 1/16W
R66	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R67	YWR1220P561D	Metal	560 ohms
R68	YWR1220P911D	Metal	910 ohms
R69	ERJ3GEYJ560	Carbon	56 ohms 1/16W
R70	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R71	ERJ3GEYJ222	Carbon	2.2K ohms 1/16W
R72	ERJ3GEYJ332	Carbon	3.3K ohms 1/16W
R73	ERJ3GEYJ561	Carbon	560 ohms 1/16W
R74	ERJ3GEYJ560	Carbon	56 ohms 1/16W
R75	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R76	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R77	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R78	ERJ14YJ102	Carbon	1K ohms 1/16W
R79,80	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R81	ERJ3GEYJ222	Carbon	2.2K ohms 1/16W
R82	YWR1220P911D	Metal	910 ohms
R83	ERJ3GEYJ682	Carbon	6.8K ohms 1/16W
R84	ERJ3GEYJ432	Carbon	4.3K ohms 1/16W
R85	YWR1220P102D	Metal	1K ohms

REF.NO.	PART NO.	DESCRIPTION	
R86	ERJ3GEYJ221	Carbon	220 ohms 1/16W
R90	ERJ3GEYJ562	Carbon	5.6K ohms 1/16W
R91	ERJ3GEYJ101	Carbon	100 ohms 1/16W
R92	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R93	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R94	ERJ3GEYJ270	Carbon	27 ohms 1/6W
R95	ERJ3GEYJ332	Carbon	3.3K ohms 1/16W
R96,97	ERJ3GEYJ222	Carbon	2.2K ohms 1/16W
R98,99	YF21162R2JT	Carbon	2.2 ohms 1/16W
R100	YW2116620JT	Carbon	62 ohms 1/16W
R101	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R102	YF2116100JT	Carbon	10 ohms 1/10W
R103	YF2116102GT	Carbon	1K ohms 1/16W
R105	ERJ3GEYJ563	Carbon	56K ohms 1/16W
R106	ERJ3GEYJ224	Carbon	220K ohms 1/16W
R107	ERJ3GEYJ101	Carbon	100 ohms 1/16W
R108,109	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R110	ERJ3GEYJ222	Carbon	2.2K ohms 1/16W
R111	ERJ3GEYJ561	Carbon	560 ohms 1/16W
R112	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R113	R1220P822D	Metal	8.2K ohms
R114	YWR1220P221D	Metal	220 ohms
R115	YFR1220P222D	Metal	2.2K ohms
R116	YF2116561JT	Carbon	560 ohms 1/16W
R117	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R118	ERJ3GEYJ222	Carbon	2.2K ohms 1/16W
R119	YF2116391JT	Carbon	390 ohms 1/16W
R120	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R121	ERJ3GEYJ123	Carbon	12K ohms 1/16W
R122,123	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R124	ERJ3GEYJ222	Carbon	2.2K ohms 1/16W
R125	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R126	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R127	ERJ3GEYJ332	Carbon	3.3K ohms 1/16W
R128	ERJ3GEYJ472	Carbon	4.7K ohms 1/16W
R129	ERJ3GEYJ563	Carbon	56K ohms 1/16W
R130	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R131	ERJ3GEYJ332	Carbon	3.3K ohms 1/16W
R132	ERJ3GEYJ223	Carbon	22K ohms 1/16W
R133	ERJ3GEYJ472	Carbon	4.7K ohms 1/16W
R134	ERJ3GEYJ332	Carbon	3.3K ohms 1/16W
R135	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R136	ERJ3GEYJ153	Carbon	15K ohms 1/16W
R137	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R138	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R139	ERJ3GEYJ432	Carbon	4.3K ohms 1/16W
R140	ERJ3GEYJ472	Carbon	4.7K ohms 1/16W
R141	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R142	YF2116100JT	Carbon	10 ohms 1/10W
R143	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R144	YW2116620JT	Carbon	62 ohms 1/16W
R145	ERJ14YJ101	Carbon	
R146	ERJ3GEYJ472	Carbon	4.7K ohms 1/16W
R147	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R148	ERJ3GEYJ222	Carbon	2.2K ohms 1/16W

REF.NO.	PART NO.	DESCRIPTION	
R149	YF2116152JT	Carbon	1.5K ohms 1/16W
R150	ERJ3GEYJ471	Carbon	470 ohms 1/16W
R151	ERJ3GEYJ682	Carbon	6.8K ohms 1/16W
R152	ERJ3GEYJ152	Carbon	1.5K ohms 1/16W
R153	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R154	ERJ3GEYJ272	Carbon	2.7K ohms 1/16W
R155	ERJ3GEYJ472	Carbon	4.7K ohms 1/16W
R156	ERJ3GEYJ222	Carbon	2.2K ohms 1/16W
R159	YF2116102GT	Carbon	1K ohms 1/16W
R160	ERJ3GEYJ560	Carbon	56 ohms 1/16W
R161	ERJ3GEYJ101	Carbon	100 ohms 1/16W
R162	YF2116331JT	Carbon	330 ohms 1/16W
R163	ERJ3GEYJ221	Carbon	220 ohms 1/16W
R164	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R165	YF2116221JT	Carbon	220 ohms 1/16W
R166	ERJ3GEYJ332	Carbon	3.3K ohms 1/16W
R167	ERJ3GEYJ223	Carbon	22K ohms 1/16W
R168	ERJ3GEYJ682	Carbon	6.8K ohms 1/16W
R169	ERJ3GEYJ560	Carbon	56 ohms 1/16W
R170	ERJ3GEYJ101	Carbon	100 ohms 1/16W
R187,188	ERJ3GEY0R00	Carbon	0 ohms 1/16W
C1	YF400104FZT	Ceramic	0.1 µF
C2	ECEV1CV470	Electrolytic	47 µF 16V
C3,4	ECEA0JGE102	Electrolytic	1000 µF 6.3V
C5	YF400104FZT	Ceramic	0.1 µF
C6	YW5CH330J5VB	Ceramic	33 pF
C7	YF400104FZT	Ceramic	0.1 µF
C8	ECEV0JV101	Electrolytic	100 µF 6.3V
C9	YF400104FZT	Ceramic	0.1 µF
C10	YW5CH330J5VB	Ceramic	33 pF
C11,12	ECEV1CV470	Electrolytic	47 µF 6.3V
C13	ECEV0JV101	Electrolytic	100 µF 6.3V
C14	YF400103XKT	Ceramic	0.01 µF
C15	YF400104FZT	Ceramic	0.1 µF
C16	ECEV1CV220	Electrolytic	22 µF 16V
C17-19	YW5X102K5VB	Ceramic	1000 pF
C20	YW5CH220J5VB	Ceramic	22 pF
C21	ECEA1CGE101	Electrolytic	100 µF 16V
C22	YW5CH330J5VB	Ceramic	33 pF
C23	ECEV1CV470	Electrolytic	47 µF 16V
C24	ECEA1CN100S	Electrolytic	10 µF 16V
C25	YW5CH131J5VB	Ceramic	130 pF
C26	YW5CH330J5VB	Ceramic	33 pF
C27	ECEA1CGE471	Electrolytic	470 µF 16V
C28	YW5CH101J5VB	Ceramic	100 pF
C29	ECEV1CV100	Electrolytic	10 µF 16V
C30	ECEV1CV470	Electrolytic	47 µF 16V
C34,35	ECEV1CV100	Electrolytic	10 µF 16V
C36,37	ECEA1CGE471	Electrolytic	470 µF 16V
C38	YW5CH101J5VB	Ceramic	100 pF
C39	ECEV1CV220	Electrolytic	22 µF 16V
C40	YW5CH331J5VB	Ceramic	330 pF
C41-43	ECEV1CV470	Electrolytic	47 µF 16V
C44	YF400104FZT	Ceramic	0.1 µF
C45	YF400471CHJT	Ceramic	470 pF

REF.NO.	PART NO.	DESCRIPTION	
C46,47	ECEV1CV470	Electrolytic	47 µF 16V
C48	ECEV1CV100	Electrolytic	10 µF 16V
C49	YF400331CHJT	Ceramic	330 pF
C50,51	YF400104FZT	Ceramic	0.1 µF
C52,53	ECEA1CGE471	Electrolytic	470 µF 16V
C54	ECEV1CV100	Electrolytic	10 µF 16V
C55	YW5CH200J5VB	Ceramic	20 pF
C56	ECEV1CV470	Electrolytic	47 µF 16V
C57	YF400104FZT	Ceramic	0.1 µF
C58	YW5CH101J5VB	Ceramic	100 pF
C59	YW5CH131J5VB	Ceramic	130 pF
C60	YF400104FZT	Ceramic	0.1 µF
C62	YW5CH330J5VB	Ceramic	33 pF
C63	YF400222XKT	Ceramic	2200 pF
C64	ECEA1CGE101	Electrolytic	100µF 16V
C65	ECEV1CV470	Electrolytic	47 µF 16V
C66,67	ECEA1CGE471	Electrolytic	470 µF 16V
C68	ECEA0JGE102	Electrolytic	1000 µF 6.3V
C80	YW5X103K2VB	Ceramic	0.01 µF
C81	ECEV1CV470	Electrolytic	47 µF 16V
C83-85	ECEA1CGE471	Electrolytic	470 µF 16V
C86,87	YW5X103K2VB	Ceramic	0.01 µF
L1	YWNL45100J	Coil	10 µH
L2-4	NL45T101K	Coil	100 µH
L5-7	YWNL45100J	Coil	10 µH
L8	YWNL324R7M	Coil	4.7 µH
X1	YFEF0-FC4004	Crystal Oscillator	
CN1	YW530140810	8-pin Connector	
CN2	S2PS2T2EF	2-pin Connector	
CN3	YW530140610	6-pin Connector	
CN4	YW530140510	5-pin Connector	

ACCESSORY PARTS/PACKAGING PARTS

M90	YWV8QA2754AN	Operating Instructions
M92	XZB26X40C05	Polyethylene Bag
M93	XZB35X50C05	Polyethylene Bag
M95	YWV9CA1788BN	Packaging Assy
M96	YWV5EA1112A2	Decoration Flame
M97	YWV4JA040A4	Mount Base

REF.NO.	PART NO.	DESCRIPTION
CEILING MOUNT BRACKET WV-Q101		
MISCELLANEOUS		
M1	YWV2SA2209B3	Mounting Angle
M2	YWV1KA0146A4	Washer A
M4	YWV1KA0147A4	Washer B (X3)
M5	XVG6F50FX	Standard Screw (X3)
M6	YWV5YA0055AN	Band Assy
M7	YWV7QA2766A4	Main Label
M8	YWV7SA1513A4	Front Label
ACCESSORY PARTS/PACKAGING PARTS		
M11	YWV8QA2750AN	Operating Instructions
M12	YWV8PB0019A3	Tool
M13	XZB26X40C05	Polyethylene Bag
M14	YWT15X20C03	Polyethylene Bag
M15	YWT20X35C03	Polyethylene Bag
M16	YWV9CA1784AN	Packaging Assy

REF.NO.	PART NO.	DESCRIPTION
CEILING MOUNT BRACKET WV-Q102		
MISCELLANEOUS		
M1	YWV2SA2209B3	Mounting Angle
M2	YWV1KA0146A4	Washer A
M4	YWV5YA0055AN	Band Assy
M5	YWV9AA0770A4	Mechanical Assy
M9	YWV6GA0202A2	Plate
M10	YWV2SA2210A2	Mounting Plate
M12	YWV7QA2767A4	Main Label
M13	YWV7SA1513A4	Front Label
M14	XSB3 + 6FX	Binding Head Screws
M15	XSB6 + 15FX	Binding Head Screws (X3)
M16	XSN3 + 20FX	Pan Head Machin Screws (X4)
ACCESSORY PARTS/PACKAGING PARTS		
M21	YWV8QA2751AN	Operating Instructions
M22	XZB26X40C05	Polyethylene Bag
M23	XZB45X63C05	Polyethylene Bag
M24	YWT15X20C03	Polyethylene Bag
M25	YWV8PB0017A2	Tool
M26	YWV8PB0018A2	Tool
M28	YWV9CA1786AN	Packaging Assy

V00P441

ORDER NO. AVS9407890S8

Service Manual

Combination Camera

WV-CS300

Supplement - 2

Please file and use this supplement manual together with original service manual for Model No. WV-CS300 Order No. AVS9204558C8

IC Description

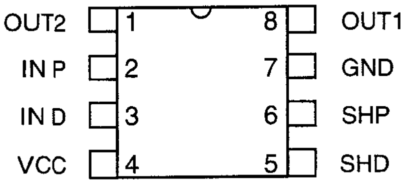
■ This IC Description Describes the Major ICs of WV-CS300.

Panasonic

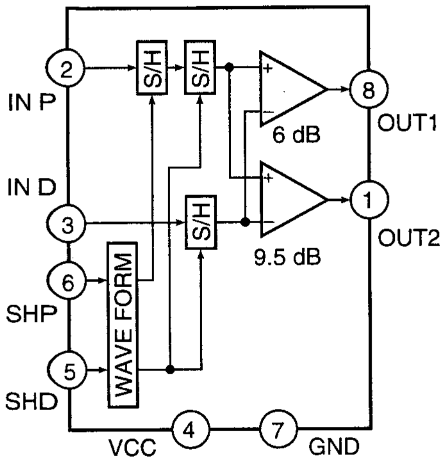
CIRCUIT DESCRIPTION

IC Description

1. IC2 on the Drive Board is using the Correlated Double Sampling IC YWCXA1439M.
   Description of this IC is as follows:

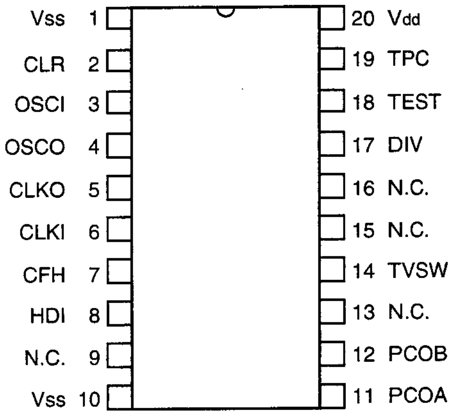

OUT2
IN P
IN D
VCC
1
2
3
4
8
7
6
5
OUT1
GND
SHP
SHD

(TOP VIEW)


2
IN P
IN D
3
6
SHP
5
SHD
S/H
S/H
S/H
WAVE FORM
6 dB
9.5 dB
8
OUT1
1
OUT2
4
VCC
7
GND

Pin	Name	I/O	Description
1	OUT 2	O	CDS signal (9.5 dB Gain) output terminal.
2	IN P	I	CCD signal input terminal.
3	IN D	I	CCD signal input terminal.
4	VCC	–	Power supply terminal.
5	SHD	I	Sample Hold Data Pulse input terminal. Active : High
6	SHP	I	Sample Hold Precharge Pulse input terminal. Active : High
7	GND	–	Ground terminal.
8	OUT1	O	CDS signal (6 dB Gain) output terminal.

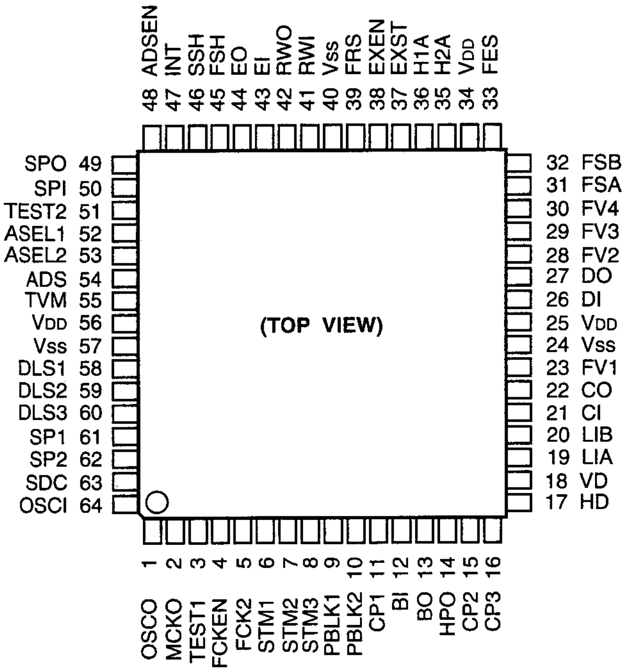
2. IC3 on the Drive Board is using the PLL IC MN53003 LBJ.
   Description of this IC is as follows:


Vss 1
CLR 2
OSCI 3
OSCO 4
CLKO 5
CLKI 6
CFH 7
HDI 8
N.C. 9
Vss 10
20 Vdd
19 TPC
18 TEST
17 DIV
16 N.C.
15 N.C.
14 TVSW
13 N.C.
12 PCOB
11 PCOA

(TOP VIEW)

Pin	Name	I/O	Description
1	Vss	–	Ground terminal.
2	CLR	I	CLR signal input terminal.
3	OSCI	I	Oscillator signal input terminal.
4	OSCO	O	Oscillator signal output terminal.
5	CLKO	O	Clock Pulse output terminal.
6	CLKI	I	Clock Pulse input terminal.
7	CFH	O	CFH signal output terminal.
8	HDI	I	HD signal input terminal.
9	N.C.	–	Non connection.
10	Vss	–	Ground terminal.
11	PCOA	O	PCOA signal output terminal.
12	PCOB	O	PCOB signal output terminal.
13	N.C.	–	Non connection.
14	TVSW	O	TVSW signal output terminal.
15	N.C.	–	Non connection.
16	N.C.	–	Non connection.
17	DIV	I	DIV signal input terminal.
18	TEST	I	Test signal input terminal.
19	TPC	I	TPC signal input terminal.
20	Vdd	–	Power supply terminal.

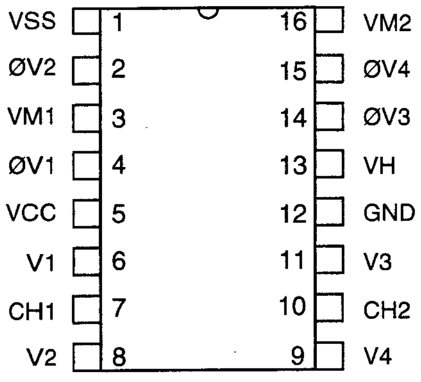
3. IC6 on the Drive Board is using the Drive Pulse Generator GAL IC YWMB621488U.
Description of this IC is as follows:


48 ADSEN
47 INT
46 SSH
45 FSH
44 EO
43 EI
42 RWO
41 RWI
40 Vss
39 FRS
38 EXEN
37 EXST
36 H1A
35 H2A
34 VDD
33 FES
SPO 49
SPI 50
TEST2 51
ASEL1 52
ASEL2 53
ADS 54
TVM 55
VDD 56
Vss 57
DLS1 58
DLS2 59
DLS3 60
SP1 61
SP2 62
SDC 63
OSCI 64
(TOP VIEW)
32 FSB
31 FSA
30 FV4
29 FV3
28 FV2
27 DO
26 DI
25 VDD
24 Vss
23 FV1
22 CO
21 CI
20 LIB
19 LIA
18 VD
17 HD
1 OSCO
2 MCKO
3 TEST1
4 FCKEN
5 FCK2
6 STM1
7 STM2
8 STM3
9 PBLK1
10 PBLK2
11 CP1
12 BI
13 BO
14 HPO
15 CP2
16 CP3

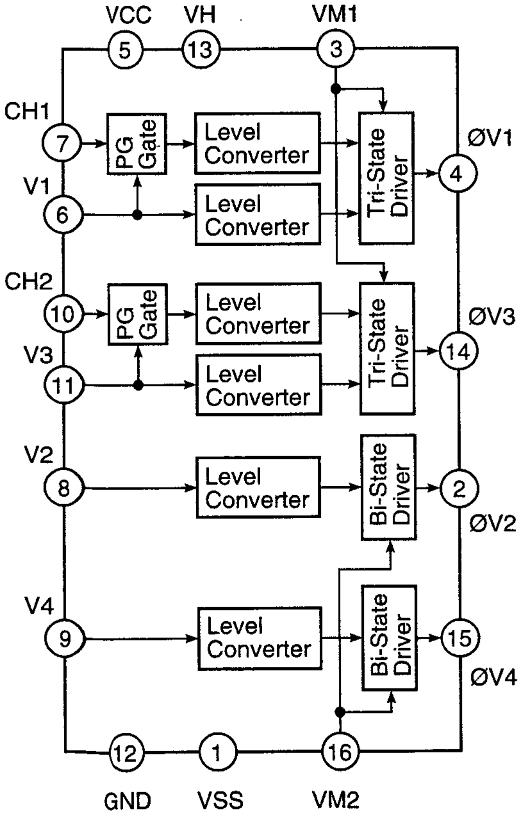
Pin	Name	I/O	Description
1	OSCO	O	Crystal oscillator output terminal.
2	MCKO	O	MCKO signal output terminal.
3	TEST1	I	Test signal Input terminal.
4	FCKN	I	FCKN signal input terminal.
5	FCK2	O	FCK2 signal output terminal.
6	STM1	I	STM1 signal input terminal.
7	STM2	I	STM2 signal input terminal.
8	STM3	I	STM3 signal input terminal.
9	PBLK1	O	Pre-Blanking signal output terminal.
10	PBLK2	O	Pre-Blanking signal output terminal.
11	CP1	O	Clamp Pulse output terminal.
12	BI	I	BI signal input terminal.
13	BO	O	BO signal output terminal.
14	HPO	O	HPO signal output terminal.
15	CP2	O	Clamp Pulse output terminal.
16	CP3	O	Clamp Pulse output terminal.
17	HD	I	HD signal input terminal.
18	VD	I	VD signal input terminal.
19	LIA	O	LIA signal output terminal.
20	LIB	O	LIB signal output terminal.
21	CI	I	CI signal input terminal.

Pin	Name	I/O	Description
22	CO	O	CO signal output terminal.
23	FV1	O	FV1 signal output terminal.
24	Vss	–	Ground terminal.
25	VDD	–	Power supply terminal.
26	DI	I	Data input terminal.
27	DO	O	Data output terminal.
28	FV2	O	FV2 signal output terminal.
29	FV3	O	FV3 signal output terminal.
30	FV4	O	FV4 signal output terminal.
31	FSA	O	FSA signal output terminal.
32	FSB	O	FSB signal output terminal.
33	FES	O	FES signal output terminal.
34	VDD	–	Power supply terminal.
35	H2A	O	H2A signal output terminal.
36	H1A	O	H1A signal output terminal.
37	EXST	I	EXST signal input terminal.
38	EXEN	I	EXEN signal input terminal.
39	FRS	O	FRS signal output terminal.
40	Vss	–	Ground terminal.
41	RWI	I	Read/Write signal input terminal.
42	RWO	O	Read/Write signal output terminal.
43	EI	I	EI signal input terminal.
44	EO	O	EO signal output terminal.
45	FHS	O	FHS signal output terminal.
46	SSH	O	SSH signal output terminal.
47	INT	I	INT signal input terminal.
48	ADSEN	I	ADSEN signal input terminal.
49	SPO	O	SP signal output terminal.
50	SPI	I	SP signal input terminal.
51	TEST2	I	Test signal input terminal.
52	ASEL1	I	ASEL1 signal input terminal.
53	ASEL2	I	ASEL2 signal input terminal.
54	ADS	O	ADS signal output terminal.
55	TVM	I	TVM signal input terminal.
56	VDD	–	Power supply terminal.
57	Vss	–	Ground terminal.
58	DLS1	I	DLS1 signal input terminal.
59	DLS2	I	DLS2 signal input terminal.
60	INPM	I	INPM signal input terminal.
61	SP1	O	SP1 signal output terminal.
62	SP2	O	SP2 signal output terminal.
63	SDC	I	SDC signal input terminal.
64	OSCI	I	Crystal oscillator input terminal.

4. IC3 on the Drive Board is using the CCD Vertical Driver IC YWUPD16501GS.
Description of this IC is as follows:

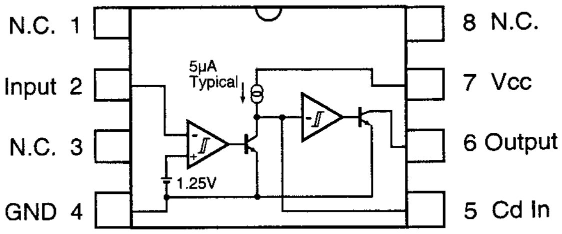

VSS 1
ØV2 2
VM1 3
ØV1 4
VCC 5
V1 6
CH1 7
V2 8
16 VM2
15 ØV4
14 ØV3
13 VH
12 GND
11 V3
10 CH2
9 V4

(TOP VIEW)

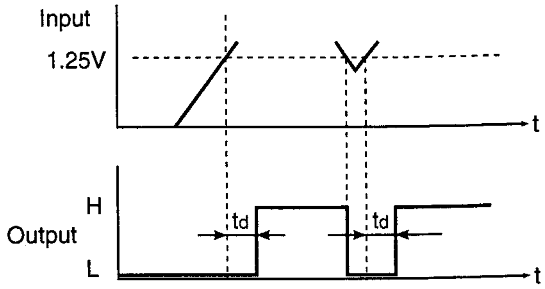

VCC
VH
VM1
5
13
3
CH1
7
V1
6
CH2
10
V3
11
V2
8
V4
9
PG Gate
PG Gate
Level Converter
Level Converter
Level Converter
Level Converter
Level Converter
Level Converter
Tri-State Driver
Tri-State Driver
Bi-State Driver
Bi-State Driver
4
ØV1
14
ØV3
2
ØV2
15
ØV4
12
1
16
GND
VSS
VM2

Pin	Name	I/O	Description
1	VSS	–	Negative Voltage supply terminal.
2	ØV2	O	Bi-State output terminal 1.
3	VM1	–	Middle Voltage supply terminal for Tri-State Drivers.
4	ØV1	O	Tri-State input terminal 1.
5	VCC	–	Power supply for input circuit section.
6	V1	I	Tri-State input terminal 1.
7	CH1	I	Photodiode Gate input terminal 1.
8	V2	I	Bi-State input terminal 1.
9	V4	I	Bi-State input terminal 2.
10	CH2	I	Photodiode Gate input terminal 2.
11	V3	I	Tri-State input terminal 2.
12	GND	–	Ground terminal.
13	VH	–	High Voltage supply terminal for Tri-State Drivers.
14	ØV3	O	Tri-State input terminal 2.
15	ØV4	O	Bi-State output terminal 2.
16	VM2	–	Middle Voltage supply terminal for Bi-State Drivers.

5. IC3 on the Control Board is using the Voltage Detector IC YWM51957BFP.
Description of this IC is as follows:

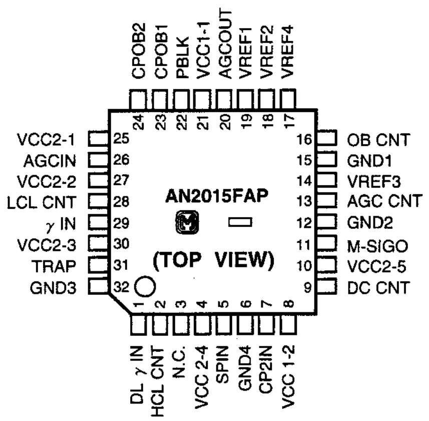

N.C. 1
Input 2
N.C. 3
GND 4
8 N.C.
7 Vcc
6 Output
5 Cd In
5μA Typical
1.25V

(TOP VIEW)

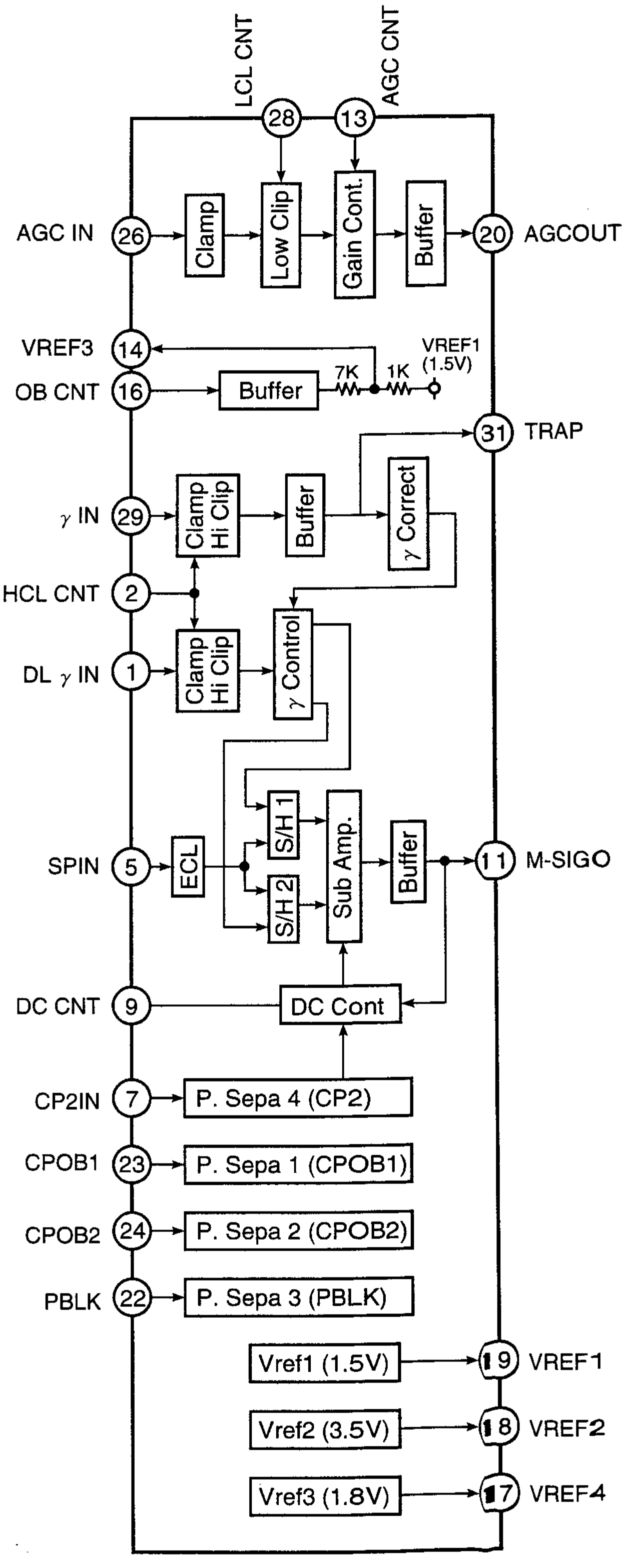


td ≈ 0.34 x Cd (pF) μsec.

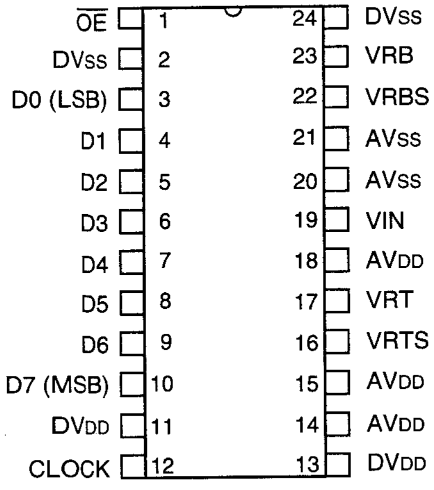
6. IC1 on the Digital Board is using the AGC/Gamma Correction IC AN2015FAP.
Description of this IC is as follows:


CPOB2
CPOB1
PBLK
VCC1-1
AGCOUT
VREF1
VREF2
VREF4
24 23 22 21 20 19 18 17
VCC2-1 25
AGCIN 26
VCC2-2 27
LCL CNT 28
γ IN 29
VCC2-3 30
TRAP 31
GND3 32
16 OB CNT
15 GND1
14 VREF3
13 AGC CNT
12 GND2
11 M-SIGO
10 VCC2-5
9 DC CNT
AN2015FAP
(TOP VIEW)
1 2 3 4 5 6 7 8
DL γ IN
HCL CNT
N.C.
VCC 2-4
SPIN
GND4
CP2IN
VCC 1-2

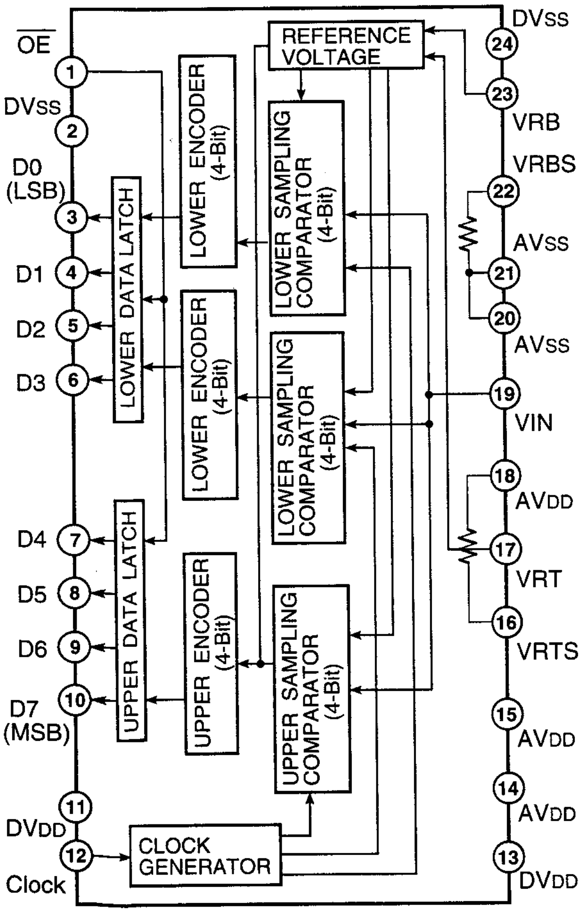
Pin	Name	I/O	Description
1	DL γ IN	I	Delayed γ Correction input terminal.
2	HCL CNT	I	Hi Clip Level Control terminal.
3	N.C.	–	Non connection.
4	VCC2-4	–	Power (4.5V typ.) supply terminal.
5	SPIN	I	Sampling Pulse input terminal.
6	GND4	–	Ground terminal.
7	CP2IN	I	CP2 Pulse input terminal.
8	VCC1-2	–	Power (8.5V typ.) supply terminal.
9	DC CNT	I	DC control terminal.
10	VCC2-5	–	Power (4.5V typ.) supply terminal.
11	M-SIGO	O	Main signal output terminal.
12	GND2	–	Ground terminal.
13	AGC CNT	I	AGC control terminal.
14	VREF3	O	Vartiable reference voltage output terminal.
15	GND1	–	Ground terminal.
16	OB CNT	I	OB signal level control terminal.
17	VREF4	O	1.8V (typ.) reference voltage output terminal.
18	VREF2	O	3.5V (typ.) reference voltage output terminal.
19	VREF1	O	1.5V (typ.) reference voltage output terminal.
20	AGCOUT	O	AGC signal output terminal.
21	VCC1-1	–	Power (8.5V typ.) supply terminal.
22	PBLK	I	Pre-Blanking signal input terminal.
23	CPOB1	I	OB Clamp signal input terminal.
24	CPOB2	I	OB Clamp signal input terminal.
25	VCC2-1	–	Power (4.5V typ.) supply terminal.
26	AGC IN	I	AGC signal input terminal.
27	VCC2-2	–	Power (4.5V typ.) supply terminal.
28	LCL CNT	I	Low Clip Level Control terminal.
29	γ IN	I	Gamma Correction input terminal.
30	VCC2-3	–	Power (4.5V typ.) supply terminal.
31	TRAP	O	TRAP signal output terminal.
32	GND3	–	Ground terminal.


LCL CNT
AGC CNT
28
13
AGC IN
26
Clamp
Low Clip
Gain Cont.
Buffer
20
AGCOUT
VREF3
14
OB CNT
16
Buffer
7K
1K
VREF1
(1.5V)
31
TRAP
γ IN
29
Clamp
Hi Clip
Buffer
γ Correct
HCL CNT
2
DL γ IN
1
Clamp
Hi Clip
γ Control
SPIN
5
ECL
S/H 1
S/H 2
Sub Amp.
Buffer
11
M-SIGO
DC CNT
9
DC Cont
CP2IN
7
P. Sepa 4 (CP2)
CPOB1
23
P. Sepa 1 (CPOB1)
CPOB2
24
P. Sepa 2 (CPOB2)
PBLK
22
P. Sepa 3 (PBLK)
Vref1 (1.5V)
19
VREF1
Vref2 (3.5V)
18
VREF2
Vref3 (1.8V)
17
VREF4

7. IC6 on the Digital Board is using the 8-Bit A/D Converter IC YWCXD1175AM.
Description of this IC is as follows:


$\overline{\text{OE}}$ 1
DVss 2
D0 (LSB) 3
D1 4
D2 5
D3 6
D4 7
D5 8
D6 9
D7 (MSB) 10
DVDD 11
CLOCK 12
24 DVss
23 VRB
22 VRBS
21 AVss
20 AVss
19 VIN
18 AVDD
17 VRT
16 VRTS
15 AVDD
14 AVDD
13 DVDD

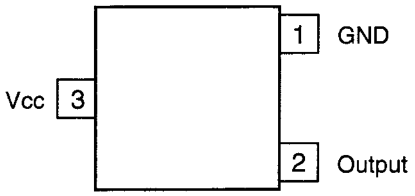
(TOP VIEW)

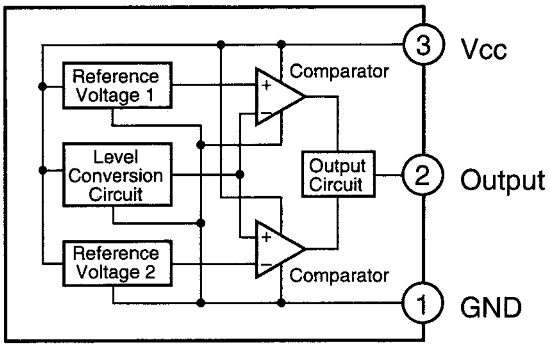

$\overline{\text{OE}}$
DVss
D0 (LSB)
D1
D2
D3
D4
D5
D6
D7 (MSB)
DVDD
Clock
REFERENCE VOLTAGE
LOWER ENCODER (4-Bit)
LOWER SAMPLING COMPARATOR (4-Bit)
LOWER DATA LATCH
LOWER ENCODER (4-Bit)
LOWER SAMPLING COMPARATOR (4-Bit)
UPPER DATA LATCH
UPPER ENCODER (4-Bit)
UPPER SAMPLING COMPARATOR (4-Bit)
CLOCK GENERATOR
DVss
VRB
VRBS
AVss
AVss
VIN
AVDD
VRT
VRTS
AVDD
AVDD
DVDD

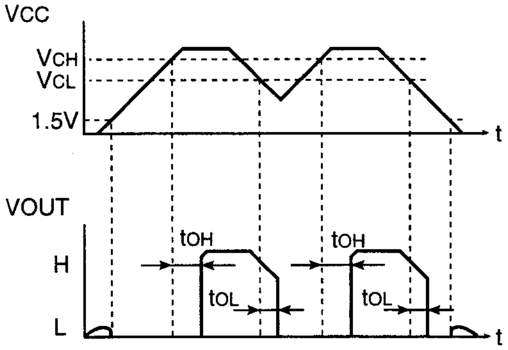
Pin	Name	I/O	Description
1	$\overline{\text{OE}}$	I	Output Enable signal input terminal.
2	DVSS	–	Ground terminal for Digital Circuit.
3	D0	O	Digital Data D0 (LSB) output terminal.
4	D1	O	Digital Data D1 (2nd.) output terminal.
5	D2	O	Digital Data D2 (3rd.) output terminal.
6	D3	O	Digital Data D3 (4th.) output terminal.
7	D4	O	Digital Data D4 (5th.) output terminal.
8	D5	O	Digital Data D5 (6th.) output terminal.
9	D6	O	Digital Data D6 (7th.) output terminal.
10	D7	O	Digital Data D7 (MSB) output terminal.
11	DVDD	–	Power supply terminal for Digital Circuit.
12	CLOCK	I	Clock input terminal.
13	DVDD	–	Power supply terminal for Digital Circuit.
14	AVDD	–	Power supply terminal for Analog Circuit.
15	AVDD	–	Power supply terminal for Analog Circuit.
16	VRTS	O	Top Voltage output terminal.
17	VRT	I	Top Voltage input terminal.
18	AVDD	–	Power supply terminal for Analog Circuit.
19	VIN	I	Analog signal input terminal.
20	AVSS	–	Ground terminal for Analog Circuit.
21	AVSS	–	Ground terminal for Analog Circuit.
22	VRBS	O	Bottom Voltage output terminal.
23	VRB	I	Bottom Voltage input terminal.
24	DVSS	–	Ground terminal for Digital Circuit.

8. IC6 on the Drive Board are using the 3.5V Reset IC MN13821P.

Description of this IC is as follows:

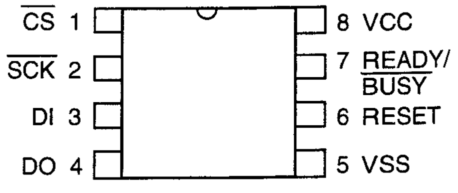

1
GND
Vcc
3
2
Output


Reference Voltage 1
Comparator
Level Conversion Circuit
Output Circuit
Reference Voltage 2
Comparator
3 Vcc
2 Output
1 GND

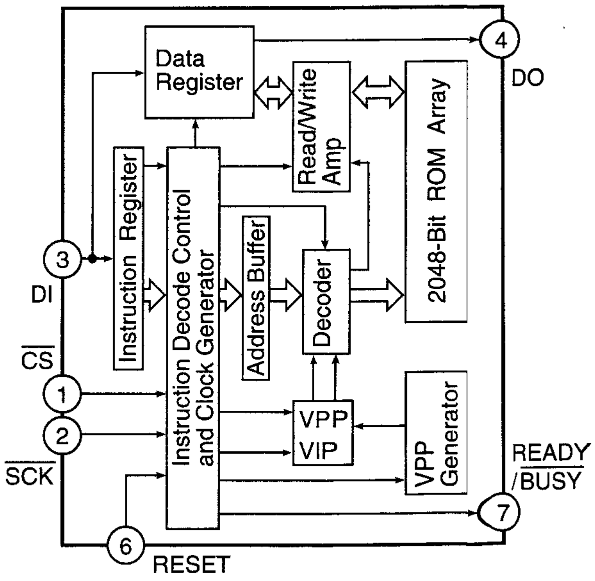


9. IC7 on the Digital Board is using the 2K EEPROM IC YWM6M80021FP.

Description of this IC is as follows:

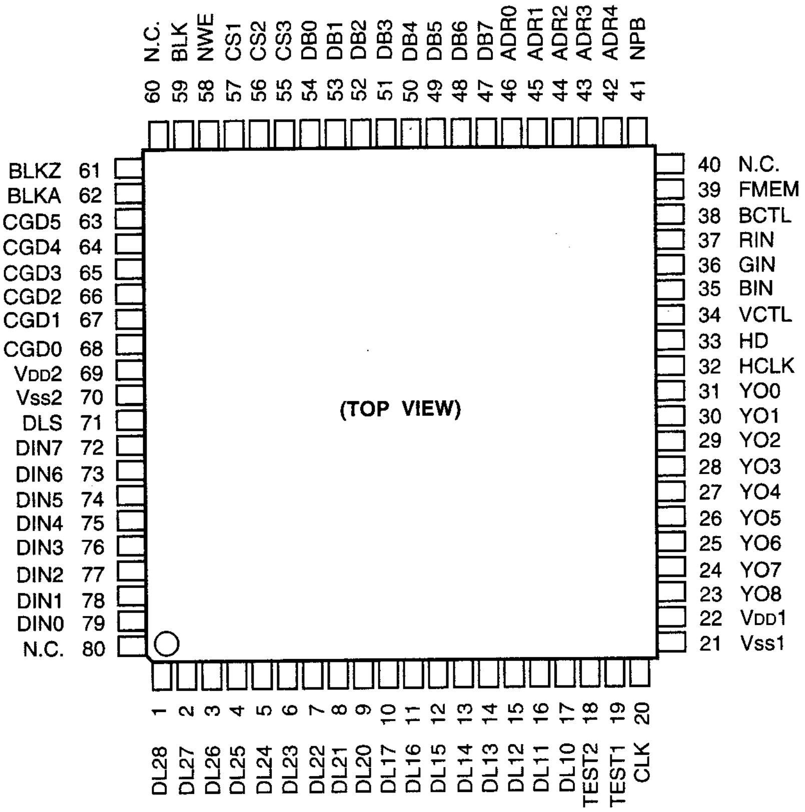

CS 1
SCK 2
DI 3
DO 4
8 VCC
7 READY/BUSY
6 RESET
5 VSS

(TOP VIEW)


Data Register
Read/Write Amp
2048-Bit ROM Array
4
DO
Instruction Register
Instruction Decode Control and Clock Generator
Address Buffer
Decoder
3
DI
CS
1
2
SCK
VPP
VIP
VPP Generator
READY /BUSY
7
6
RESET

Pin	Name	I/O	Description
1	$\overline{\text{CS}}$	I	Chip Select signal input terminal.
2	$\overline{\text{SCK}}$	I	Serial Data Clock input terminal.
3	DI	I	Serial Data input terminal.
4	DO	O	Serial Data output terminal.
5	VSS	–	Ground terminal.
6	RESET	I	Reset signal input terminal.
7	READY /$\overline{\text{BUSY}}$	O	Ready/$\overline{\text{Busy}}$ signal output terminal.
8	VCC	–	Power supply terminal.

10. IC8 on the Digital Board is using the Y Digital Signal Processor IC MN6730FHP.
Description of this IC is as follows:

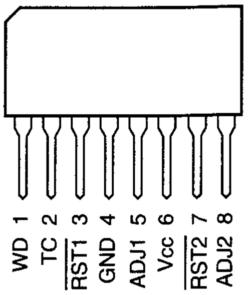

60 N.C.
59 BLK
58 NWE
57 CS1
56 CS2
55 CS3
54 DB0
53 DB1
52 DB2
51 DB3
50 DB4
49 DB5
48 DB6
47 DB7
46 ADR0
45 ADR1
44 ADR2
43 ADR3
42 ADR4
41 NPB
BLKZ 61
BLKA 62
CGD5 63
CGD4 64
CGD3 65
CGD2 66
CGD1 67
CGD0 68
VDD2 69
Vss2 70
DLS 71
DIN7 72
DIN6 73
DIN5 74
DIN4 75
DIN3 76
DIN2 77
DIN1 78
DIN0 79
N.C. 80
40 N.C.
39 FMEM
38 BCTL
37 RIN
36 GIN
35 BIN
34 VCTL
33 HD
32 HCLK
31 YO0
30 YO1
29 YO2
28 YO3
27 YO4
26 YO5
25 YO6
24 YO7
23 YO8
22 VDD1
21 Vss1
(TOP VIEW)
1 DL28
2 DL27
3 DL26
4 DL25
5 DL24
6 DL23
7 DL22
8 DL21
9 DL20
10 DL17
11 DL16
12 DL15
13 DL14
14 DL13
15 DL12
16 DL11
17 DL10
18 TEST2
19 TEST1
20 CLK

Pin	Name	I/O	Description
1	DL28	O	DL signal output terminals.
2	DL27	O	
3	DL26	O	
4	DL25	O	
5	DL24	O	
6	DL23	O	
7	DL22	O	
8	DL21	O	
9	DL20	O	
10	DL17	O	
11	DL16	O	
12	DL15	O	
13	DL14	O	
14	DL13	O	
15	DL12	O	
16	DL11	O	
17	DL10	O	
18	TEST2	I	Test 2 input terminal.

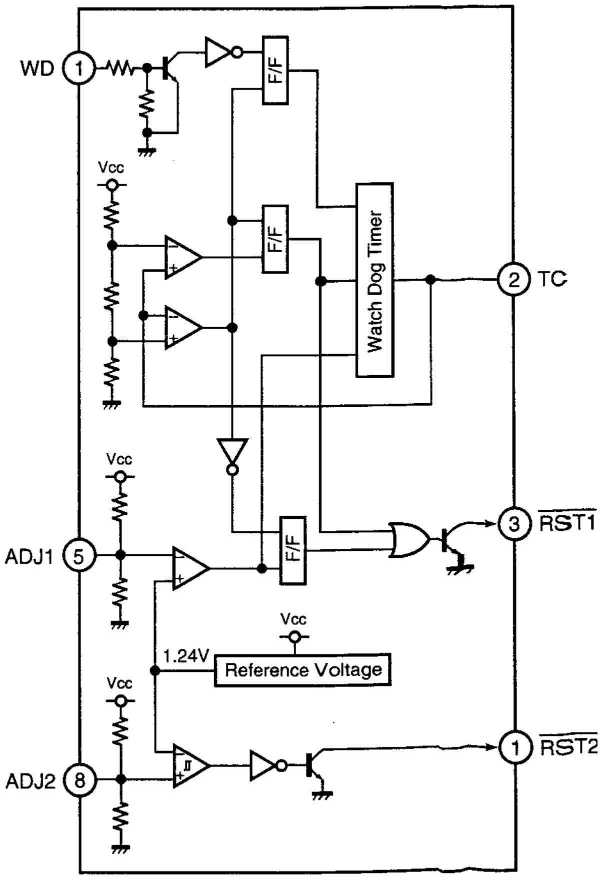
Pin	Name	I/O	Description
19	TEST1	I	Test 1 input terminal.
20	CLK	I	Clock Pulse input terminal.
21	Vss1	–	Ground terminal.
22	VDD1	–	Power supply terminal.
23	YO8	O	Luminance signal data output terminals. (8-Bit)
24	YO7	O	
25	YO6	O	
26	YO5	O	
27	YO4	O	
28	YO3	O	
29	YO2	O	
30	YO1	O	
31	YO0	O	
32	HCLK	I	HCLK signal input terminal.
33	HD	I	HD signal input terminal.
34	VCTL	I	VCTL signal input terminal.
35	BIN	I	Bch signal input terminal.
36	GIN	I	Gch signal input terminal.

Pin	Name	I/O	Description
37	RIN	I	Rch signal input terminal.
38	BCTL	I	BCTL signal input terminal.
39	FMEM	I	FMEM signal input terminal.
40	N.C.	–	Non Connection.
41	NPB	I	NPB signal input terminal.
42	ADR4	I	Address signal input terminals. (5-Bit)
43	ADR3	I	
44	ADR2	I	
45	ADR1	I	
46	ADR0	I	
47	DB7	I/O	DATA Bus terminals between Microprocessor. (8-Bit)
48	DB6	I/O	
49	DB5	I/O	
50	DB4	I/O	
51	DB3	I/O	
52	DB2	I/O	
53	DB1	I/O	
54	DB0	I/O	
55	CS3	I	Chip Select signal input terminal.
56	CS2	I	Chip Select signal input terminal.
57	CS1	I	Chip Select signal input terminal.
58	NWE	I	Write Enable signal input terminal.
59	BLK	I	Blanking signal input terminal.
60	N.C.	–	Non Connection.
61	BLKZ	O	Blanking signal output terminal.
62	BLKA	O	Blanking signal output terminal.
63	CGD5	I	CGD signal input terminals.
64	CGD4	I	
65	CGD3	I	
66	CGD2	I	
67	CGD1	I	
68	CGD0	I	
69	VDD2	–	Power supply terminal.
70	Vss2	–	Ground terminal.
71	DLS	O	DLS signal terminal.
72	DIN7	I	DIN signal intput terminals. (8-Bit)
73	DIN6	I	
74	DIN5	I	
75	DIN4	I	
76	DIN3	I	
77	DIN2	I	
78	DIN1	I	
79	DIN0	I	
80	N.C.	–	Non Connection.

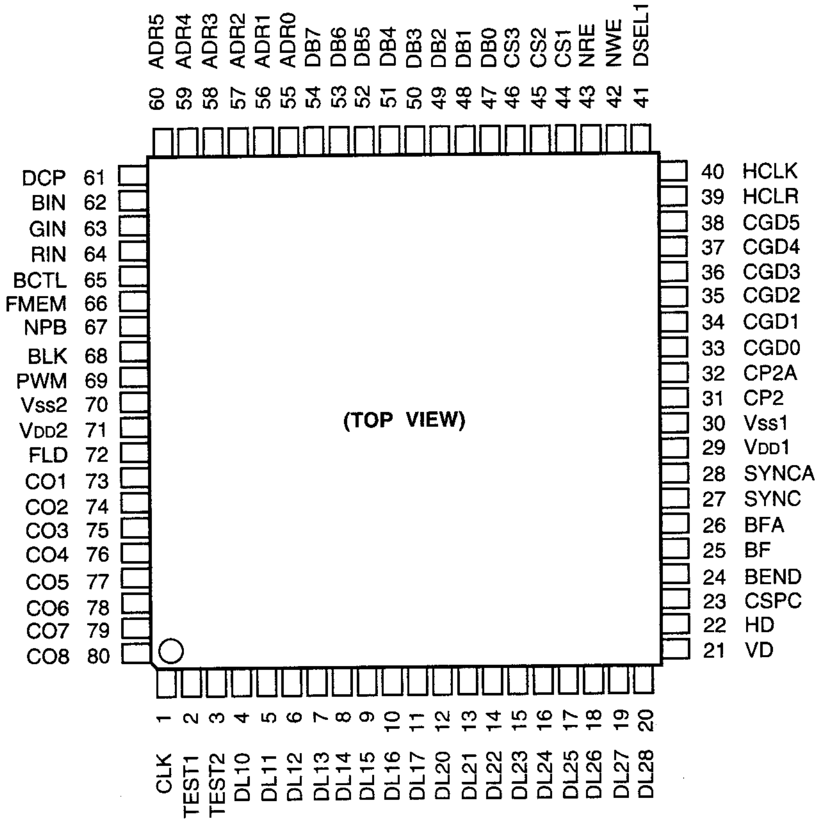
11. IC9 on the Receiver Board is using the Watch Dog IC YWM5295L.
Description of this IC is as follows:


WD 1
TC 2
$\overline{\text{RST1}}$ 3
GND 4
ADJ1 5
Vcc 6
$\overline{\text{RST2}}$ 7
ADJ2 8

Pin	Name	I/O	Description
1	WD	I	Watch Dog terminal.
2	TC	–	Time Constant setting terminal.
3	$\overline{\text{RST1}}$	O	Reset 1 signal output terminal.
4	GND	–	Ground terminal.
5	ADJ1	–	Adjusting terminal 1.
6	Vcc	–	Power supply terminal.
7	$\overline{\text{RST2}}$	O	Reset 2 signal output terminal.
8	ADJ2	–	Adjusting terminal 2.


WD ①
F/F
Vcc
F/F
Watch Dog Timer
② TC
Vcc
ADJ1 ⑤
F/F
③ $\overline{\text{RST1}}$
1.24V
Vcc
Reference Voltage
Vcc
ADJ2 ⑧
① $\overline{\text{RST2}}$

12. IC9 on the Digital Board is using the Chroma Digital Signal Processor IC MN6731FHP.
Description of this IC is as follows:

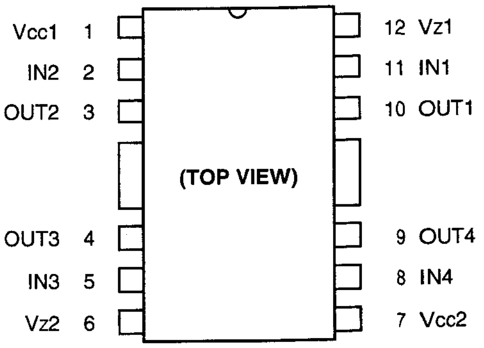

60 ADR5
59 ADR4
58 ADR3
57 ADR2
56 ADR1
55 ADR0
54 DB7
53 DB6
52 DB5
51 DB4
50 DB3
49 DB2
48 DB1
47 DB0
46 CS3
45 CS2
44 CS1
43 NRE
42 NWE
41 DSEL1
DCP 61
BIN 62
GIN 63
RIN 64
BCTL 65
FMEM 66
NPB 67
BLK 68
PWM 69
Vss2 70
VDD2 71
FLD 72
CO1 73
CO2 74
CO3 75
CO4 76
CO5 77
CO6 78
CO7 79
CO8 80
(TOP VIEW)
40 HCLK
39 HCLR
38 CGD5
37 CGD4
36 CGD3
35 CGD2
34 CGD1
33 CGD0
32 CP2A
31 CP2
30 Vss1
29 VDD1
28 SYNCA
27 SYNC
26 BFA
25 BF
24 BEND
23 CSPC
22 HD
21 VD
1 CLK
2 TEST1
3 TEST2
4 DL10
5 DL11
6 DL12
7 DL13
8 DL14
9 DL15
10 DL16
11 DL17
12 DL20
13 DL21
14 DL22
15 DL23
16 DL24
17 DL25
18 DL26
19 DL27
20 DL28

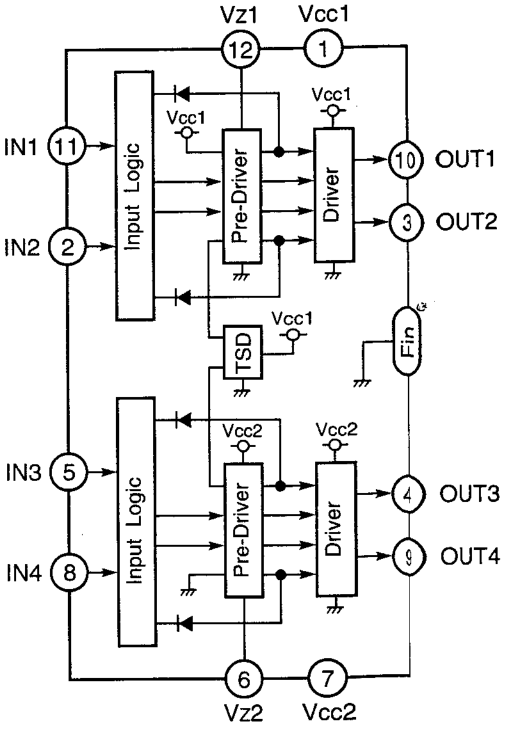
Pin	Name	I/O	Description
1	CLK	I	Clock Pulse input terminal.
2	TEST1	I	Test 1 input terminal.
3	TEST2	I	Test 1 input terminal.
4	DL10	I	DL signal input terminals.
5	DL11	I	
6	DL12	I	
7	DL13	I	
8	DL14	I	
9	DL15	I	
10	DL16	I	
11	DL17	I	
12	DL20	I	
13	DL21	I	
14	DL22	I	
15	DL23	I	
16	DL24	I	
17	DL25	I	
18	DL26	I	

Pin	Name	I/O	Description
19	DL27	I	DL Signal input terminals.
20	DL28	I	
21	VD	I	VD signal input terminal.
22	HD	I	HD signal input terminal.
23	CSPC	I	CSPC signal input terminal.
24	BEND	O	Border End signal output terminal.
25	BF	I	BF signal input terminal.
26	BFA	I	BFA signal input terminal.
27	SYNC	I	Sync signal input terminal.
28	SYNCA	O	Sync signal output terminal.
29	VDD1	–	Power supply terminal.
30	Vss1	–	Ground terminal.
31	CP2	I	Clamp Pulse input terminal.
32	CP2A	O	Clamp Pulse output terminal.
33	CGD0	I	CGD Signal input terminals.
34	CGD1	I	
35	CGD2	I	
36	CGD3	I	

Pin	Name	I/O	Description
37	CGD4	I	CGD signal input terminals.
38	CGD5	I	
39	HCLR	I	HCLR signal input terminal.
40	HCLK	O	HCLK signal output terminal.
41	DSEL1	I	DSEL1 signal input terminal.
42	NWE	I	Write Enable signal input terminal.
43	NRE	I	Read Enable signal input terminal.
44	CS1	I	Chip Select signal input terminal.
45	CS2	I	Chip Select signal input terminal.
46	CS3	I	Chip Select signal input terminal.
47	DB0	I/O	DATA Bus terminals between Microprocessor. (8-Bit)
48	DB1	I/O	
49	DB2	I/O	
50	DB3	I/O	
51	DB4	I/O	
52	DB5	I/O	
53	DB6	I/O	
54	DB7	I/O	
55	ADR0	I	Address signal input terminals. (5-Bit)
56	ADR1	I	
57	ADR2	I	
58	ADR3	I	
59	ADR4	I	
60	ADR5	I	
61	DCP	I	DCP signal input terminal.
62	BIN	I	B signal input terminal.
63	GIN	I	G signal input terminal.
64	RIN	I	R signal input terminal.
65	BCTL	I	BCTL signal input terminal.
66	FMEM	I	FMEM signal input terminal.
67	NPB	I	NPB signal input terminal.
68	BLK	I	Blanking signal input terminal.
69	PWM	O	PWM signal output terminal.
70	Vss2	–	Ground terminal.
71	VDD2	–	Power supply terminal.
72	FLD	O	FLD signal output terminal.
73	CO1	O	Chroma signal output terminals. (8-Bit)
74	CO2	O	
75	CO3	O	
76	CO4	O	
77	CO5	O	
78	CO6	O	
79	CO7	O	
80	CO8	O	

13. IC11 on the Control Board is using the Dual Motor Drivers IC YWLB1648.
Description of this IC is as follows:

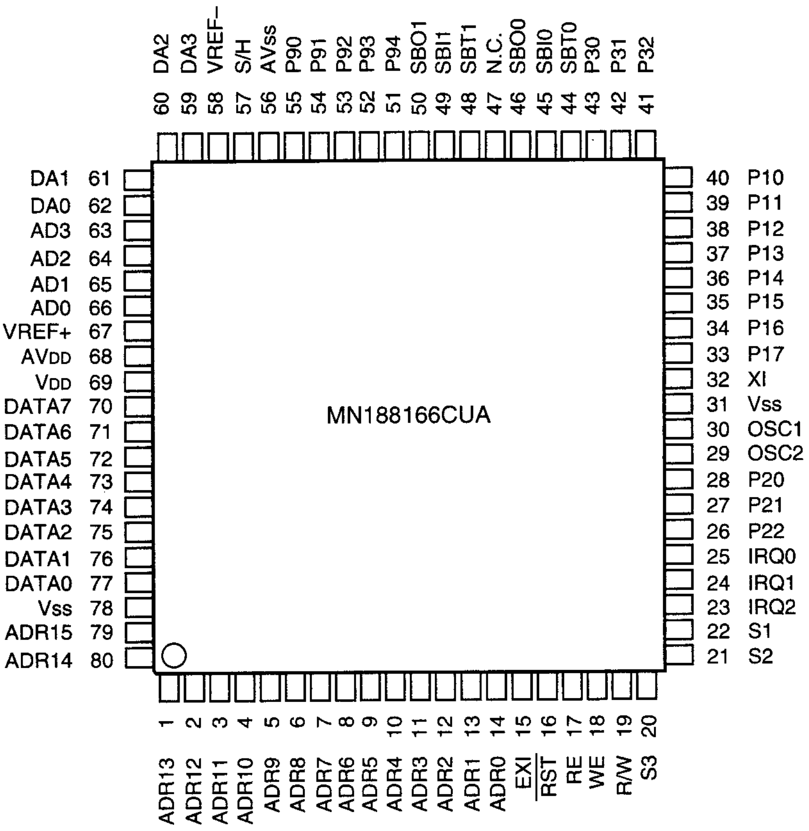

Vcc1 1
IN2 2
OUT2 3
OUT3 4
IN3 5
Vz2 6
12 Vz1
11 IN1
10 OUT1
9 OUT4
8 IN4
7 Vcc2
(TOP VIEW)


Vz1
Vcc1
12
1
IN1
11
IN2
2
Input Logic
Vcc1
Pre-Driver
Vcc1
Driver
10
OUT1
3
OUT2
TSD
Vcc1
Fin
IN3
5
IN4
8
Input Logic
Vcc2
Pre-Driver
Vcc2
Driver
4
OUT3
9
OUT4
6
7
Vz2
Vcc2

Truth Table of Input Logic Section

IN1	IN2	OUT1	OUT2	IN3	IN4	OUT3	OUT4
L	L	Open	Open	L	L	Open	Open
H	L	H	L	H	L	H	L
L	H	L	H	L	H	L	H
H	H	L	L	H	H	L	L

14. IC10 on the Digital Board is using the 8-Bit Microprocessor IC MN188166CUA.
Description of this IC is as follows:


DA2 60
DA3 59
VREF– 58
S/H 57
AVss 56
P90 55
P91 54
P92 53
P93 52
P94 51
SBO1 50
SBI1 49
SBT1 48
N.C. 47
SBO0 46
SBI0 45
SBT0 44
P30 43
P31 42
P32 41
DA1 61
DA0 62
AD3 63
AD2 64
AD1 65
AD0 66
VREF+ 67
AVDD 68
VDD 69
DATA7 70
DATA6 71
DATA5 72
DATA4 73
DATA3 74
DATA2 75
DATA1 76
DATA0 77
Vss 78
ADR15 79
ADR14 80
40 P10
39 P11
38 P12
37 P13
36 P14
35 P15
34 P16
33 P17
32 XI
31 Vss
30 OSC1
29 OSC2
28 P20
27 P21
26 P22
25 IRQ0
24 IRQ1
23 IRQ2
22 S1
21 S2
MN188166CUA
1 ADR13
2 ADR12
3 ADR11
4 ADR10
5 ADR9
6 ADR8
7 ADR7
8 ADR6
9 ADR5
10 ADR4
11 ADR3
12 ADR2
13 ADR1
14 ADR0
15 EXI
16 RST
17 RE
18 WE
19 R/W
20 S3

(TOP VIEW)

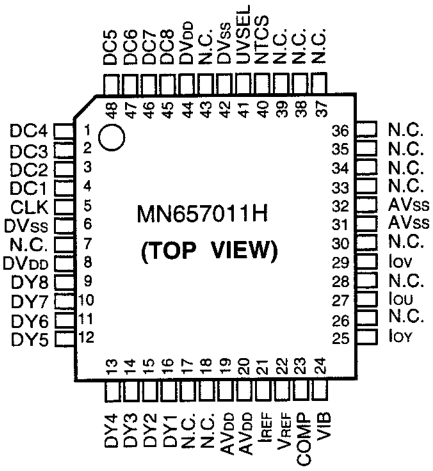
Pin	Name	I/O	Description
1	ADR13	O	Address signal output terminals. (16-Bit)
2	ADR12	O	
3	ADR11	O	
4	ADR10	O	
5	ADR9	O	
6	ADR8	O	
7	ADR7	O	
8	ADR6	O	
9	ADR5	O	
10	ADR4	O	
11	ADR3	O	
12	ADR2	O	
13	ADR1	O	
14	ADR0	O	

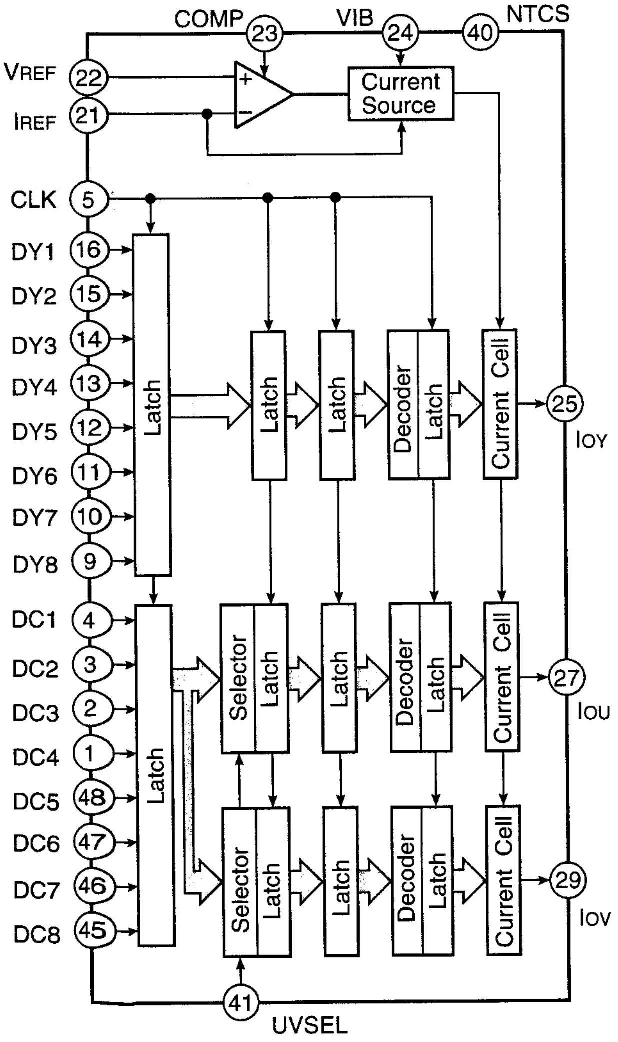
Pin	Name	I/O	Description
15	EXI	I	External signal input terminal.
16	$\overline{\text{RST}}$	I	Reset signal input terminal.
17	RE	O	Read Enable signal output terminal.
18	WE	O	Write Enable signal output terminal.
19	R/W	I/O	Read/Write signal input/output terminal.
20	S3	I/O	S3 signal input/output terminal.
21	S2	I/O	S2 signal input/output terminal.
22	S1	I/O	S1 signal input/output terminal.
23	IRQ2	I	IRQ2 signal input terminal.
24	IRQ1	I	IRQ1 signal input terminal.
25	IRQ0	I	IRQ0 signal input terminal.

Pin	Name	I/O	Description
27	P22	I	P22 signal input terminal.
27	P21	I	P21 signal input terminal.
28	P20	I	P20 signal input terminal.
29	OSC2	O	Crystal Oscillator output terminal.
30	OSC1	I	Crystal Oscillator input terminal.
31	Vss	–	Ground terminal.
32	XI	I	XI signal input/output terminal.
33	P17	O	P17 signal output terminal.
34	P16	O	P16 signal output terminal.
35	P15	O	P15 signal output terminal.
36	P14	O	P14 signal output terminal.
37	P13	O	P13 signal output terminal.
38	P12	O	P12 signal output terminal.
39	P11	O	P11 signal output terminal.
40	P10	O	P10 signal output terminal.
41	P32	O	P32 signal output terminal.
42	P31	O	P31 signal output terminal.
43	P30	O	P30 signal output terminal.
44	SBT0	O	SBT0 signal output terminal.
45	SBI0	I	SBI0 signal input terminal.
46	SBO0	O	SBO0 signal output terminal.
47	N.C.	–	Non connection.
48	SBT1	I	SBT1 signal input terminal.
49	SBI1	I/O	SBI1 signal input/output terminal.
50	SBO1	O	SBO1 signal output terminal.
51	P94	I	P94 signal input terminal.
52	P93	I	P93 signal input terminal.
53	P92	I	P92 signal input terminal.
54	P91	I	P91 signal input terminal.
55	P90	I	P90 signal input terminal.
56	AVss	–	Ground terminal.
57	S/H	–	S/H terminal.
58	VREF–	I	VREF– voltage input terminal.
59	DA3	O	DA3 signal output terminal.
60	DA2	O	DA2 signal output terminal.
61	DA1	O	DA1 signal output terminal.
62	DA0	O	DA0 signal output terminal.
63	AD3	I	AD3 signal input terminal.
64	AD2	I	AD2 signal input terminal.
65	AD1	I	AD1 signal input terminal.
66	AD0	I	AD0 signal input terminal.
67	VREF+	I	VREF+ voltage input terminal.
68	AVDD	–	Power supply terminal.
69	VDD	–	Power supply terminal.

Pin	Name	I/O	Description
70	DATA7	I/O	Data input/output terminals. (8-Bit)
71	DATA6	I/O	
72	DATA5	I/O	
73	DATA4	I/O	
74	DATA3	I/O	
75	DATA2	I/O	
76	DATA1	I/O	
77	DATA0	I/O	
78	Vss	–	Ground terminal.
79	ADR15	O	Address signal output terminals. (16-Bit)
80	ADR15	O	

15. IC12 on the Digital Board is using the 8-Bit 3-ch D/A Converter IC MN65701FHP.
Description of this IC is as follows:

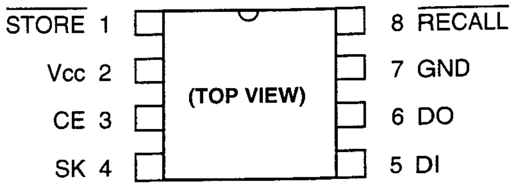

MN657011H
(TOP VIEW)
DC4 1
DC3 2
DC2 3
DC1 4
CLK 5
DVss 6
N.C. 7
DVDD 8
DY8 9
DY7 10
DY6 11
DY5 12
DY4 13
DY3 14
DY2 15
DY1 16
N.C. 17
N.C. 18
AVDD 19
AVDD 20
IREF 21
VREF 22
COMP 23
VIB 24
IOY 25
N.C. 26
IOU 27
N.C. 28
IOV 29
N.C. 30
AVss 31
AVss 32
N.C. 33
N.C. 34
N.C. 35
N.C. 36
N.C. 37
N.C. 38
N.C. 39
NTCS 40
UVSEL 41
DVss 42
N.C. 43
DVDD 44
DC8 45
DC7 46
DC6 47
DC5 48

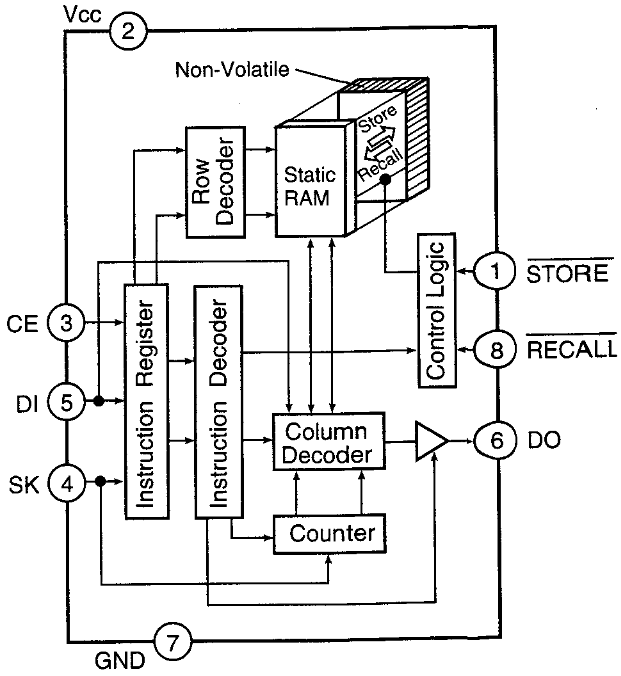

COMP 23
VIB 24
40 NTCS
VREF 22
IREF 21
Current Source
CLK 5
DY1 16
DY2 15
DY3 14
DY4 13
DY5 12
DY6 11
DY7 10
DY8 9
DC1 4
DC2 3
DC3 2
DC4 1
DC5 48
DC6 47
DC7 46
DC8 45
Latch
Selector
Decoder
Current Cell
25 IOY
27 IOU
29 IOV
41 UVSEL

Pin	Name	I/O	Description
1	DC4	I	Chroma Digital Data (5th.) input terminal.
2	DC3	I	Chroma Digital Data (6th.) input terminal.
3	DC2	I	Chroma Digital Data (7th.) input terminal.
4	DC1	I	Chroma Digital Data (MSB) input terminal.
5	CLK	I	Clock input terminal.
6	DVss	–	Ground terminal for Digital Circuit.
7	N.C.	–	Non Connection.
8	DVDD	–	+5V supply terminal for Digital Circuit.
9	DY8	I	Luminance Digital Data (LSB) input terminal.
10	DY7	I	Luminance Digital Data (2nd.) input terminal.
11	DY6	I	Luminance Digital Data (3rd.) input terminal.
12	DY5	I	Luminance Digital Data (4th.) input terminal.
13	DY4	I	Luminance Digital Data (5th.) input terminal.
14	DY3	I	Luminance Digital Data (6th.) input terminal.
15	DY2	I	Luminance Digital Data (7th.) input terminal.
16	DY1	I	Luminance Digital Data (MSB) input terminal.
17	N.C.	–	Non Connection.
18	N.C.	–	Non Connection.
19	AVDD	–	+5V supply terminal for Analog Circuit.
20	AVDD	–	+5V supply terminal for Analog Circuit.
21	IREF	I	Full scale adjuting resistor connecting terminal.
22	VREF	I	Reference Voltage supply terminal.
23	COMP	I	Phase compensation input terminal.
24	VIB	I	Capacitor connecting terminal.

Pin	Name	I/O	Description
25	IOY	O	R signal analog current signal output terminal.
26	N.C.	–	Non Connection.
27	IOU	O	G signal analog current output terminal.
28	N.C.	–	Non Connection.
29	IOV	O	B signal analog current output terminal.
30	N.C.	–	Non Connection.
31	AVss	–	Ground terminal for Analog Circuit.
32	AVss	–	Ground terminal for Analog Converter Circuit.
33	N.C.	–	Non Connection.
34	N.C.	–	Non Connection.
35	N.C.	–	Non Connection.
36	N.C.	–	Non Connection.
37	N.C.	–	Non Connection.
38	N.C.	–	Non Connection.
39	N.C.	–	Non Connection.
40	NTCS	I	Chroma signal 2's Complement /Binary Selectimg signal input terminal. L = 2's Complement input H = Binary input
41	UVSEL	I	Chroma U and Chroma V Selecting signal input terminal. L = U signal H = V signal
42	DVss	–	Ground terminal for Digital Circuit.
43	N.C.	–	Non Connection.
44	VVDD	–	+5V supply terminal for Digital Circuit.
45	DC8	I	Chroma Digital Data (LSB) input terminal.
46	DC7	I	Chroma Digital Data (2nd.) input terminal.
47	DC6	I	Chroma Digital Data (3rd.) input terminal.
48	DC5	I	Chroma Digital Data (4th.) input terminal.

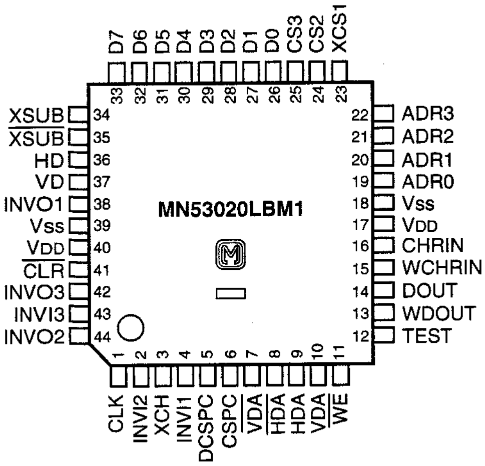
16. IC10 on the Receiver Board is using the Non-Volatile 64-Bit (8-word x 8-Bit) ROM IC YWS24S30IF. Description of this IC is as follows:


STORE 1
Vcc 2
CE 3
SK 4
(TOP VIEW)
8 RECALL
7 GND
6 DO
5 DI


Vcc 2
Non-Volatile
Row Decoder
Static RAM
Store
Recall
Control Logic
1 STORE
8 RECALL
CE 3
DI 5
SK 4
Instruction Register
Instruction Decoder
Column Decoder
6 DO
Counter
GND 7

Pin	Name	I/O	Description
1	$\overline{\text{STORE}}$	I	Store signal input terminal.
2	Vcc	–	Power supply terminal.
3	CE	I	Chip Enable signal input terminal.
4	SK	I	Serial Data Clock input terminal.
5	DI	I	Serial Data input terminal.
6	DO	O	Serial Data output terminal.
7	GND	–	Ground terminal.
8	$\overline{\text{RECALL}}$	I	Recall signal input terminal.

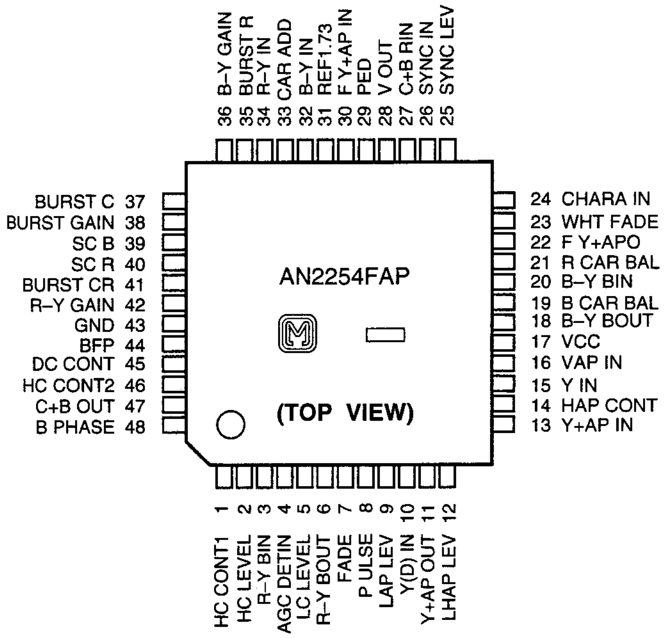
17. IC13 on the Digital Board is using the ELC Signal Generator IC MN53020LBM1.
Description of this IC is as follows:


D7 D6 D5 D4 D3 D2 D1 D0 CS3 CS2 XCS1
33 32 31 30 29 28 27 26 25 24 23
XSUB 34
$\overline{\text{XSUB}}$ 35
HD 36
VD 37
INVO1 38
Vss 39
VDD 40
$\overline{\text{CLR}}$ 41
INVO3 42
INVI3 43
INVO2 44
MN53020LBM1
22 ADR3
21 ADR2
20 ADR1
19 ADR0
18 Vss
17 VDD
16 CHRIN
15 WCHRIN
14 DOUT
13 WDOUT
12 TEST
1 2 3 4 5 6 7 8 9 10 11
CLK INVI2 XCH INVI1 DCSPC CSPC $\overline{\text{VDA}}$ $\overline{\text{HDA}}$ HDA VDA $\overline{\text{WE}}$

(TOP VIEW)

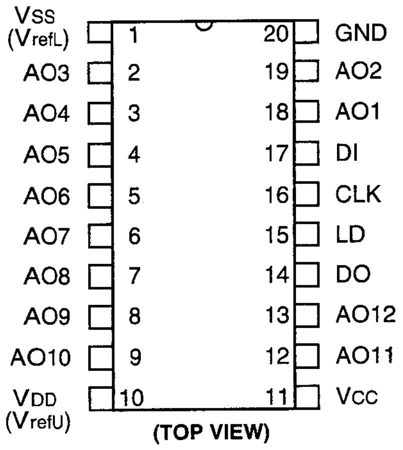
Pin	Name	I/O	Description
1	CLK	I	Clock Pulse input terminal.
2	INVI2	I	INVI2 signal input terminal.
3	XCH	I	Clock Oscillator output terminal.
4	INVI1	I	INVI1 signal input terminal.
5	DCSPC	O	DCPSC signal output terminal.
6	CSPC	I	CSPC signal output terminal.
7	$\overline{\text{VDA}}$	O	$\overline{\text{VDA}}$ signal output terminal.
8	$\overline{\text{HDA}}$	O	$\overline{\text{HDA}}$ signal output terminal.
9	HDA	I	HDA signal input terminal.
10	VDA	I	VDA signal input terminal.
11	$\overline{\text{WE}}$	I	Write Enable signal input terminal.
12	TEST	–	Test terminal.
13	WDOUT	O	WD signal output terminal.
14	DOUT	O	Data output terminal.
15	WCHRIN	I	Wide Character signal input terminal.
16	CHRIN	I	Character signal input terminal.
17	VDD	–	Power supply terminal.
18	Vss	–	Ground terminal.
19	ADR0	I	Address signal input terminals. (4-Bit)
20	ADR1	I	
21	ADR2	I	
22	ADR3	I	
23	XCS1	I	Chip Select signal input terminal.
24	CS2	I	Chip Select signal input terminal.
25	CS3	I	Chip Select signal input terminal.
26	D0	I	Data input terminals. (8-Bit)
27	D1	I	
28	D2	I	
29	D3	I	
30	D4	I	
31	D5	I	Data input terminals. (8-Bit)
32	D6	I	
33	D7	I	
34	XSUB	O	XSUB signal output terminal.
35	$\overline{\text{XSUB}}$	O	$\overline{\text{XSUB}}$ signal output terminal.
36	HD	I	HD signal input terminal.
37	VD	I	VD signal input terminal.
38	INVO1	O	INVO1 signal output terminal.
39	Vss	–	Ground terminal.
40	VDD	–	Power supply terminal.
41	$\overline{\text{CLR}}$	I	$\overline{\text{CLR}}$ signal input terminal.
42	INVO3	O	INVO3 signal output terminal.
43	INVI3	I	INVI3 input terminal.
44	INVO2	O	INVO2 signal output terminal.

18. IC4 on the Sync/Encoder Board is using the Video Signal Encoder IC AN2254FAP.
Description of this IC is as follows:

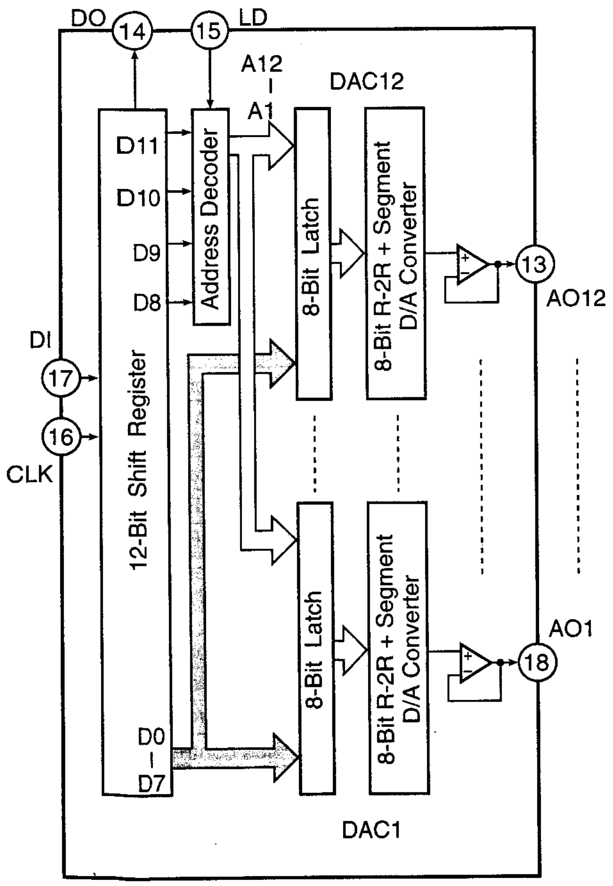

36 B–Y GAIN
35 BURST R
34 R–Y IN
33 CAR ADD
32 B–Y IN
31 REF1.73
30 F Y+AP IN
29 PED
28 V OUT
27 C+B RIN
26 SYNC IN
25 SYNC LEV
BURST C 37
BURST GAIN 38
SC B 39
SC R 40
BURST CR 41
R–Y GAIN 42
GND 43
BFP 44
DC CONT 45
HC CONT2 46
C+B OUT 47
B PHASE 48
AN2254FAP
(TOP VIEW)
24 CHARA IN
23 WHT FADE
22 F Y+APO
21 R CAR BAL
20 B–Y BIN
19 B CAR BAL
18 B–Y BOUT
17 VCC
16 VAP IN
15 Y IN
14 HAP CONT
13 Y+AP IN
1 HC CONT1
2 HC LEVEL
3 R–Y BIN
4 AGC DETIN
5 LC LEVEL
6 R–Y BOUT
7 FADE
8 P ULSE
9 LAP LEV
10 Y(D) IN
11 Y+AP OUT
12 LHAP LEV

Pin	Name	I/O	Description
1	HC CONT1	I	High Chroma Control 1 signal input terminal.
2	HC LEVEL	I	High Chroma Control Level adjustment terminal.
3	R–Y BIN	I	R–Y Buffer input terminal.
4	AGC DET IN	I	AGC Detector DC input terminal.
5	LC LEVEL	I	Low Chroma Control Level adjustment terminal.
6	R–Y BOUT	O	R–Y Buffer output terminal.
7	FADE	I	Fade Control signal input terminal.
8	PULSE	I	CP, WHD and BLK Pulses input terminal. CP2 : 3.5V WHD : 2.0V C. BLK : 1.0V
9	LAP LEV	O	Low Luminance Aperture Control Level adjustment terminal.
10	Y(D) IN	I	Y_H delayed signal input terminal.
11	Y+AP OUT	O	Luminance and Aperture signals output terminal.
12	LHAP LEV	O	Horizontal Aperture Low Level Clip adjustment terminal.
13	Y+AP IN	I	Luminance and Aperture signals input terminal.
14	HAP CONT	I	Horizontal Aperture Gain adjustment terminal.
15	Y IN	I	YH (through) signal input terminal.
16	VAP IN	I	Vertical Aperture signal input terminal.
17	VCC	–	Power supply terminal.
18	B–Y BOUT	O	B–Y Buffer output terminal.
19	B CAR BAL	I	B–Y Carrier Balance adjustment terminal.
20	B–Y BIN	I	B–Y Buffer input terminal.
21	R CAR BAL	I	R–Y Carrier Balance adjustment terminal.
22	F Y+APO	O	Faded Luminance and Aperture signal output terminal.
23	WHT FADE	I	White Fade adjustment terminal.
24	CHARA IN	I	Character input terminal.
25	SYNC LEV	I	Sync signal Gain control terminal.
26	SYNC IN	I	Sync signal input terminal.
27	C+B RIN	I	Chroma and Burst signal input terminal.
28	V OUT	O	Video signal output terminal.
29	PED	I	Pedestal adjustment terminal.
30	F Y+AP IN	I	Faded Luminance and Aperture signals input terminal.
31	REF1.73	O	Reference Voltage output terminal (1.73V typ.)
32	B–Y IN	I	B–Y signal input terminal.
33	CAR ADD	I	Carrier Add adjustment terminal.
34	R–Y IN	I	R–Y signal input terminal.
35	BURST R	–	Resistor connecting terminal for Burst circuit.
36	B–Y Gain	I	B–Y Gain control terminal.
37	BURST C	–	Capacitor connecting terminal for Burst circuit.
38	BURST GAIN	I	Burst Gain control terminal.
39	SC B	I	Sub Carrier B input terminal.
40	SC R	I	Sub Carrier B input terminal.
41	BURST CR	–	Capacitor and Resistor connecting terminal for Burst circuit.
42	R–Y Gain	I	R–Y Gain control terminal.
43	GND	–	Ground terminal.
44	BFP	I	BFP signal input terminal.
45	DC CONT	–	DC Bias control terminal.
46	HC CONT2	I	High Chroma Control 2 signal input terminal.
47	C+B OUT	O	Chroma and Burst signals output terminal.
48	B PHASE	I	Burst Phase adjustment terminal.

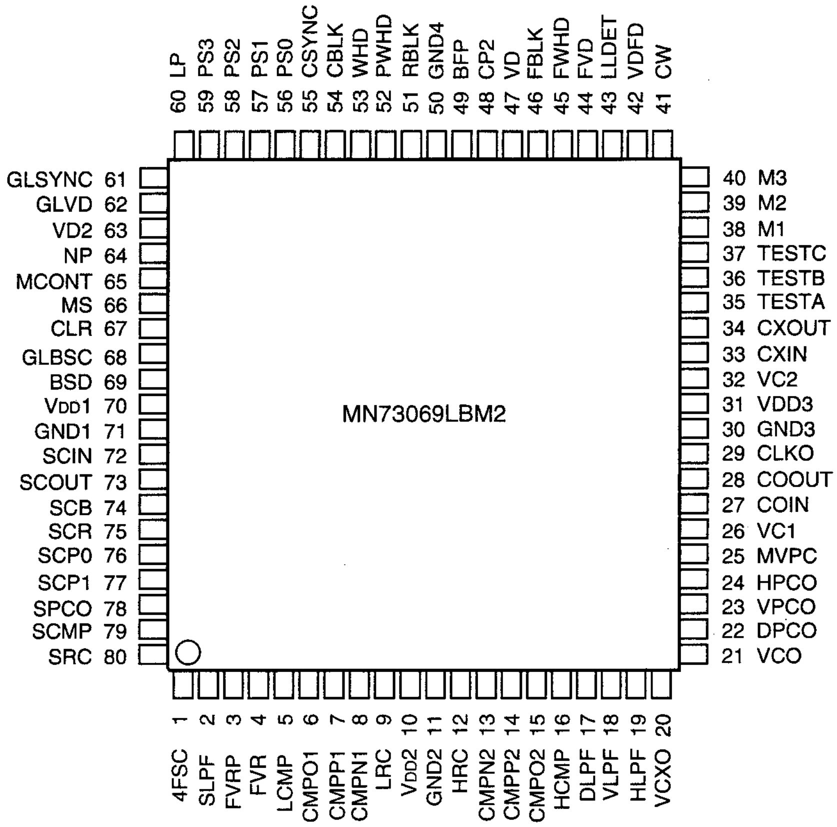
19. IC5 on the Sync/Encoder Board is using the 8-Bit 12-ch D/A Converter IC YWM62352GP.
Description of this IC is as follows:


Vss (VrefL) 1
AO3 2
AO4 3
AO5 4
AO6 5
AO7 6
AO8 7
AO9 8
AO10 9
VDD (VrefU) 10
20 GND
19 AO2
18 AO1
17 DI
16 CLK
15 LD
14 DO
13 AO12
12 AO11
11 Vcc
(TOP VIEW)

Pin	Name	I/O	Description
1	Vss (VrefL)	–	Lower reference voltage supply terminal for D/A Converter circuit.
2	AO3	O	Analog Data 3 output terminal.
3	AO4	O	Analog Data 4 output terminal.
4	AO5	O	Analog Data 5 output terminal.
5	AO6	O	Analog Data 6 output terminal.
6	AO7	O	Analog Data 7 output terminal.
7	AO8	O	Analog Data 8 output terminal.
8	AO9	O	Analog Data 9 output terminal.
9	AO10	O	Analog Data 10 output terminal.
10	VDD (VrefU)	–	Upper reference voltage supply terminal for D/A Converter circuit.
11	Vcc	–	Power supply terminal terminal.
12	AO11	O	Analog Data 11 output terminal.
13	AO12	O	Analog Data 12 output terminal.
14	DO	O	MSB Data output terminal from 12-Bit Shift Register.
15	LD	I	Load signal input terminal. Data of 12-Bit Shift Register should be loaded to Decoder and D/A Output Registers when LD = H.
16	CLK	I	Shift Clock input terminal. Serial Data from DI terminal should be input to Decoder and 12-Bit Shif Register at raising edge of this signal.
17	DI	I	12-Bit Serial Data input terminal.
18	AO1	O	Analog Data 1 output terminal.
19	AO2	O	Analog Data 2 output terminal.
20	GND	–	Ground terminal.


DO
14
15
LD
A12
I
A1
DAC12
D11
D10
D9
D8
Address Decoder
8-Bit Latch
8-Bit R-2R + Segment D/A Converter
13
AO12
DI
17
16
CLK
12-Bit Shift Register
8-Bit Latch
8-Bit R-2R + Segment D/A Converter
AO1
18
D0
I
D7
DAC1

20. IC7 on the Sync/Encoder Board is using the Sync Signal Generator IC MN73069LBM2.
Description of this IC is as follows:

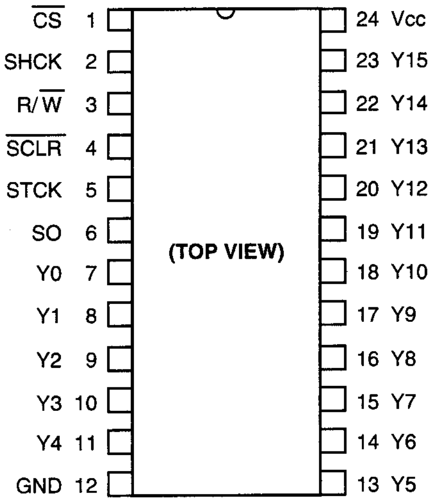

60 LP
59 PS3
58 PS2
57 PS1
56 PS0
55 CSYNC
54 CBLK
53 WHD
52 PWHD
51 RBLK
50 GND4
49 BFP
48 CP2
47 VD
46 FBLK
45 FWHD
44 FVD
43 LLDET
42 VDFD
41 CW
GLSYNC 61
GLVD 62
VD2 63
NP 64
MCONT 65
MS 66
CLR 67
GLBSC 68
BSD 69
VDD1 70
GND1 71
SCIN 72
SCOUT 73
SCB 74
SCR 75
SCP0 76
SCP1 77
SPCO 78
SCMP 79
SRC 80
40 M3
39 M2
38 M1
37 TESTC
36 TESTB
35 TESTA
34 CXOUT
33 CXIN
32 VC2
31 VDD3
30 GND3
29 CLKO
28 COOUT
27 COIN
26 VC1
25 MVPC
24 HPCO
23 VPCO
22 DPCO
21 VCO
MN73069LBM2
1 4FSC
2 SLPF
3 FVRP
4 FVR
5 LCMP
6 CMPO1
7 CMPP1
8 CMPN1
9 LRC
10 VDD2
11 GND2
12 HRC
13 CMPN2
14 CMPP2
15 CMPO2
16 HCMP
17 DLPF
18 VLPF
19 HLPF
20 VCXO

(TOP VIEW)

Pin	Name	I/O	Description
1	4FSC	O	4FSC signal output terminal.
2	SLPF	I	SLPF signal input terminal.
3	FVRP	I	FVRP signal input terminal.
4	FVR	I	FVR signal input terminal.
5	LCMP	I	LCMP signal input terminal.
6	CMPO1	O	CMPO1 signal output terminal.
7	CMPP1	O	CMPP1 signal output terminal.
8	CMPN1	O	CMPN1 signal output terminal.
9	LRC	O	LRC signal output terminal.
10	VDD2	–	+5V supply terminal.
11	GND2	–	Ground terminal.
12	HRC	O	HRC signal output terminal.
13	CMPN2	O	CMPN2 signal output terminal.
14	CMPP2	O	CMPP2 signal output terminal.
15	CMPO2	O	CMPO2 signal output terminal.
16	HCMP	I	HCMP signal input terminal.
17	DLPF	I	DLPF signal input terminal.
18	VLPF	I	VLPF signal input terminal.
19	HLPF	I	HLPF signal input terminal.
20	VCXO	O	VCXO signal output terminal.
21	VCO	O	VCO signal output terminal.
22	DPCO	O	DPCO signal output terminal.

Pin	Name	I/O	Description
23	VPCO	O	VPCO signal input terminal.
24	HPCO	O	HPCO signal input terminal.
25	MVPC	I	MVPC signal input terminal.
26	VC1	O	VC1 signal input terminal.
27	COIN	I	CO signal input terminal.
28	COOUT	O	CO signal output terminal.
29	CLKO	O	Clock Pulse output terminal.
30	GND3	–	Ground terminal.
31	VDD3	–	+5V supply terminal.
32	VC2	O	VC2 signal input terminal.
33	CXIN	I	CX signal input terminal.
34	CXOUT	O	CX signal output terminal.
35	TESTA	I	TESTA signal input terminal.
36	TESTB	I	TESTB signal input terminal.
37	TESTC	I	TESTC signal input terminal.
38	M1	O	M1 signal output terminal.
39	M2	O	M2 signal output terminal.
40	M3	O	M3 signal output terminal.
41	CW	I	CW signal input terminal.
42	VDFD	I	VDFD signal input terminal.
43	LLDET	I	LL Detect signal input terminal.
44	FVD	O	FVD signal output terminal.
45	FWHD	O	FWHD signal output terminal.
46	FBLK	O	FBLK signal output terminal.
47	VD	O	VD signal output terminal.
48	CP2	O	Clamp Pulse output terminal.
49	BF	O	BF signal output terminal.
50	GND4	–	Ground terminal.
51	RBLK	I	Pre-Blanking signal input terminal.
52	RWHD	I	RWHD signal input terminal.
53	WHD	O	WHD signal output terminal.
54	CBLK	O	Composite Blanking signal output terminal.
55	CSYNC	O	Composite Sync signal output terminal.
56	PS0	I	PS0 signal output terminal.
57	PS1	I	PS1 signal output terminal.
58	PS2	I	PS2 signal output terminal.
59	PS3	I	PS3 signal output terminal.
60	LP	I	LP signal output terminal.
61	GLSYNC	I	GLSYNC signal output terminal.
62	GLVD	I	GLVD signal input terminal.
63	VD2	I	VD2 signal input terminal.
64	NP	I	NTSC/PAL switching signal input terminal. H = NTSC L = PAL
65	MCONT	I	MCONT signal input terminal.
66	MS	I	MS signal input terminal.
67	CLR	I	CLR signal input terminal.
68	GLBSC	I	GLBSC signal input terminal.
69	BSD	I	Burst Detect signal input terminal.
70	VDD1	–	+5V supply terminal.
71	GND1	–	Ground terminal.
72	SCIN	I	SC signal input terminal.
73	SCOUT	O	SC signal output terminal.
74	SCB	O	SCB signal output terminal.
75	SCR	O	SCR signal output terminal.
76	SCP0	I	SCP0 signal input terminal.
77	SCP1	I	SCP1 signal input terminal.
78	SPCO	O	SPCO signal output terminal.
79	SCMP	I	SCMP signal output terminal.
80	SRC	O	SRC signal output terminal.

21. IC4 on the Control Board is using the 16-Bit Shift Register IC YWHD74HC673P.
Description of this IC is as follows:


$\overline{CS}$ 1
SHCK 2
R/$\overline{W}$ 3
$\overline{SCLR}$ 4
STCK 5
SO 6
Y0 7
Y1 8
Y2 9
Y3 10
Y4 11
GND 12
24 Vcc
23 Y15
22 Y14
21 Y13
20 Y12
19 Y11
18 Y10
17 Y9
16 Y8
15 Y7
14 Y6
13 Y5
(TOP VIEW)

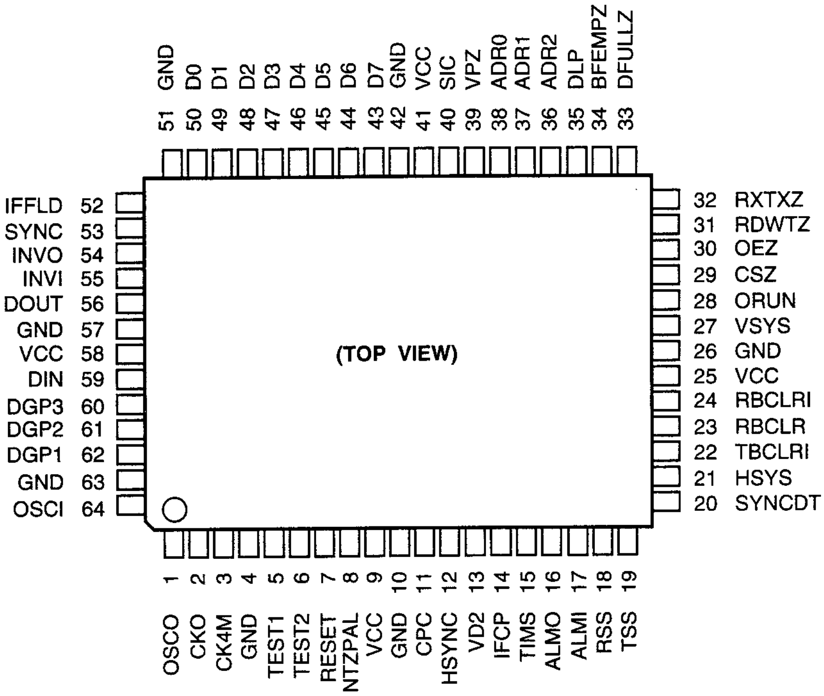
Truth Table

Inputs					Serial Output	Function
$\overline{CS}$	Shift Register		Storage			
	R/$\overline{W}$	SHCK	$\overline{SCLR}$	STCK	SO	
*	L	*	L	*	Z	L input to $\overline{SCLR}$ clears Storage registers; I/O depends on $\overline{CS}$ and R/$\overline{W}$
H	*	*	L	*	Z	
L	H	*	L	*	Q15	
H	*	*	*	*	Z	No shifting or loading.
L	L	↓	*	*	Z	Shift and write (load).
L	H	↓	*	L	Q14n	Shift and read.
L	H	↓	L	H	L	Re-load shift registers from storage, no shifting.
L	H	↓	H	H	Y15n	
L	L	*	H	↑	Z	Load storage from shift registers.

* : Don't care.
Z : High Impedance

Pin	Name	I/O	Description
1	$\overline{CS}$	I	Chip Select signal input terminal.
2	SHCK	I	Shift Clock Pulse input terminal.
3	R/$\overline{W}$	I	Read/Write signal input terminal.
4	$\overline{SCLR}$	I	Storage Clear signal input terminal.
5	STCK	I	Storage Clock Pulse input terminal.
6	SO	O	Serial Data output terminal.
7	Y0	O	Storage Register output terminals. (16-Bit)
8	Y1	O	
9	Y2	O	
10	Y3	O	
11	Y4	O	
12	GND	–	Ground terminal.
13	Y5	O	Storage Register output terminals. (16-Bit)
14	Y6	O	
15	Y7	O	
16	Y8	O	
17	Y9	O	
18	Y10	O	
19	Y11	O	
20	Y12	O	
21	Y13	O	
22	Y14	O	
23	Y15	O	
24	Vcc	–	Power supply terminal.

22. IC4 on the Receiver Board is using the Data Communication GAL IC YWCF37808PG.
Description of this IC is as follows:


GND 51
D0 50
D1 49
D2 48
D3 47
D4 46
D5 45
D6 44
D7 43
GND 42
VCC 41
SIC 40
VPZ 39
ADR0 38
ADR1 37
ADR2 36
DLP 35
BFEMPZ 34
DFULLZ 33
IFFLD 52
SYNC 53
INVO 54
INVI 55
DOUT 56
GND 57
VCC 58
DIN 59
DGP3 60
DGP2 61
DGP1 62
GND 63
OSCI 64
(TOP VIEW)
32 RXTXZ
31 RDWTZ
30 OEZ
29 CSZ
28 ORUN
27 VSYS
26 GND
25 VCC
24 RBCLRI
23 RBCLR
22 TBCLRI
21 HSYS
20 SYNCDT
1 OSCO
2 CKO
3 CK4M
4 GND
5 TEST1
6 TEST2
7 RESET
8 NTZPAL
9 VCC
10 GND
11 CPC
12 HSYNC
13 VD2
14 IFCP
15 TIMS
16 ALMO
17 ALMI
18 RSS
19 TSS

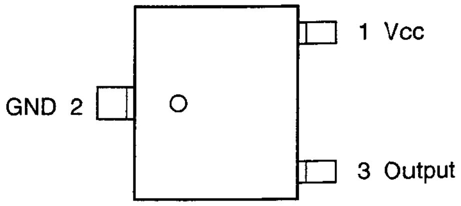
Pin	Name	I/O	Description
1	OSCO	O	Oscillator signal output terminal.
2	CKO	O	Clock signal output terminal.
3	CK4M	I	CK4M signal input terminal.
4	GND	–	Ground terminal.
5	TEST1	I	Test signal input terminals.
6	TEST2	I	
7	RESET	I	Reset signal input terminal.
8	NTZPAL	I	NTSC/PAL select signal input terminal.
9	VCC	–	Power supply terminal.
10	GND	–	Ground terminal.
11	CPC	I	CPC signal input terminal.
12	HSYNC	O	HSYNC signal output terminal.
13	VD2	I	VD2 signal input terminal.
14	IFCP	O	IFCP signal output terminal.
15	TIMS	I	TIMS signal input terminal.
16	ALMO	O	ALMO signal output terminal.
17	ALMI	I	ALMI signal input terminal.
18	RSS	I	RSS signal input terminal.
19	TSS	I	TSS signal input terminal.
20	SYNCDET	O	SYNC detect signal output terminal.

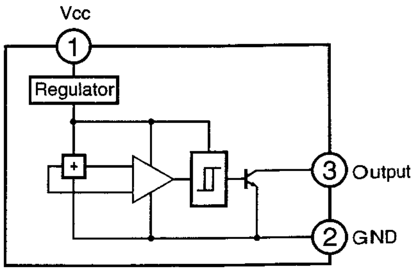
Pin	Name	I/O	Description
21	HSYS	I	HSYS signal input terminal.
22	TBCLRI	I	TBCLRI signal input terminal.
23	RBCLR	O	RBCLR signal output terminal.
24	RBCLRI	I	RBCLRI signal input terminal.
25	VCC	–	Power supply terminal.
26	GND	–	Ground terminal.
27	VSYS	I	VSYS signal input terminal.
28	ORUN	O	ORUN signal output terminal.
29	CSZ	I	Chip Select signal input terminal.
30	OEZ	I	Output Enable signal input terminal.
31	RDWTZ	I	Read/Write signal input terminal.
32	RXTXZ	I	RX/TX signal input terminal.
33	DFULLZ	O	DFULL signal input terminal.
34	BFEMPZ	O	Buffer empty signal input terminal.
35	DLP	I	DLP signal input terminal.
36	ADR2	I	Address signal input terminals.
37	ADR1	I	
38	ADR0	I	
39	VPZ	O	VP signal output terminal.
40	SIC	O	SIC signal output terminal.

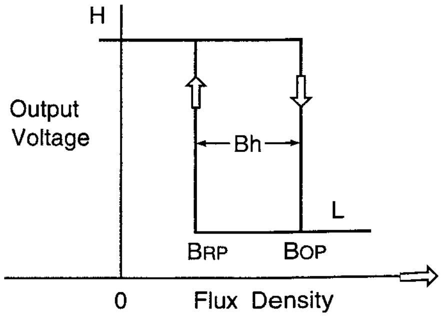
Pin	Name	I/O	Description
41	VCC	–	Power supply terminal.
42	GND	–	Ground terminal.
43	D7	I/O	DATA input/output terminals.
44	D6	I/O	
45	D5	I/O	
46	D4	I/O	
47	D3	I/O	
48	D2	I/O	
49	D1	I/O	
50	D0	I/O	
51	GND	–	Ground terminal.
52	IFFLD	O	IFFLD signal input terminal.
53	SYNC	I	SYNC signal input terminal.
54	INVO	O	INVO signal output terminal.
55	INVI	I	INVI signal input terminal.
56	DOUT	O	Data output terminal.
57	GND	–	Ground terminal.
58	VCC	–	Power supply terminal.
59	DIN	I	Data input terminal.
60	DGP3	O	DGP signal output terminals.
61	DGP2	O	
62	DGP1	O	
63	GND	–	Ground terminal.
64	OSCI	I	Oscillator signal input terminal.

23. IC100 and IC101 on the Pan-LimitBoard and IC102 and IC103 on the Tilt-Limit Board are using the Hall IC YWEW450.

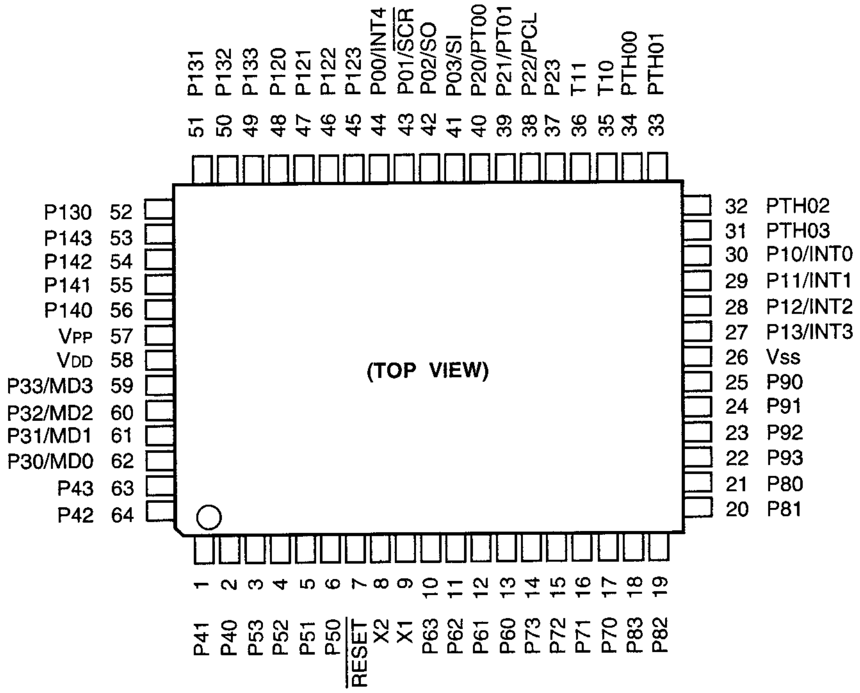
Description of this IC is as follows:







24. IC5 on the Receiver Board is using the 4-Bit Microprocessor IC YWD75116FF10.
Description of this IC is as follows:


(TOP VIEW)
51 P131
50 P132
49 P133
48 P120
47 P121
46 P122
45 P123
44 P00/INT4
43 P01/SCR
42 P02/SO
41 P03/SI
40 P20/PT00
39 P21/PT01
38 P22/PCL
37 P23
36 T11
35 T10
34 PTH00
33 PTH01
32 PTH02
31 PTH03
30 P10/INT0
29 P11/INT1
28 P12/INT2
27 P13/INT3
26 Vss
25 P90
24 P91
23 P92
22 P93
21 P80
20 P81
52 P130
53 P143
54 P142
55 P141
56 P140
57 VPP
58 VDD
59 P33/MD3
60 P32/MD2
61 P31/MD1
62 P30/MD0
63 P43
64 P42
1 P41
2 P40
3 P53
4 P52
5 P51
6 P50
7 RESET
8 X2
9 X1
10 P63
11 P62
12 P61
13 P60
14 P73
15 P72
16 P71
17 P70
18 P83
19 P82

Pin	Name	I/O	Description
1	P41	O	P41 signal output terminal.
2	P40	O	P40 signal output terminal.
3	P53	I/O	P53 signal input/output terminal.
4	P52	I/O	P52 signal input/output terminal.
5	P51	I/O	P51 signal input/output terminal.
6	P50	I/O	P50 signal input/output terminal.
7	$\overline{\text{RESET}}$	I	Reset signal input terminal.
8	X2	I	Crystal oscillator input terminal.
9	X1	O	Crystal oscillator output terminal.
10	P63	I/O	Data Bus input/output terminals. (8-Bit)
11	P62	I/O	
12	P61	I/O	
13	P60	I/O	
14	P73	I/O	
15	P72	I/O	
16	P71	I/O	
17	P70	I/O	
18	P83	O	P83 signal output terminal.
19	P82	O	P82 signal output terminal.
20	P81	O	P81 signal output terminal.
21	P80	O	P80 signal output terminal.

Pin	Name	I/O	Description
22	P93	O	P93 signal output terminal.
23	P92	O	P92 signal output terminal.
24	P91	O	P91 signal output terminal.
25	P90	O	P90 signal output terminal.
26	Vss	–	Ground terminal.
27	P13/INT3	I	P13/INT3 signal input terminal.
28	P12/INT2	I	P12/INT2 signal input terminal.
29	P11/INT1	I	P11/INT1 signal input terminal.
30	P10/INT0	I	P10/INT0 signal input terminal.
31	PTH03	I	PTH03 signal input terminal.
32	PTH02	I	PTH02 signal input terminal.
33	PTH01	I	PTH01 signal input terminal.
34	PTH00	I	PTH00 signal input terminal.
35	T10	I	T10 signal input terminal.
36	T11	I	T11 signal input terminal.
37	P23	O	P23 signal output terminal.
38	P22/PCL	O	P22/PCL signal output terminal.
39	P21/PT01	O	P21/PT01 signal output terminal.
40	P20/PT00	O	P21/PT00 signal output terminal.
41	P03/SI	I	P03/SI signal input terminal.
42	P02/SO	I	P02/SO signal input terminal.

Pin	Name	I/O	Description
43	P01/$\overline{\text{SCR}}$	I	P01/$\overline{\text{SCR}}$ signal input terminal.
44	P00/INT4	I	P00/INT4 signal input terminal.
45	P123	I/O	P123 signal input/output terminal.
46	P122	I/O	P122 signal input/output terminal.
47	P121	I/O	P121 signal input/output terminal.
48	P120	I/O	P120 signal input/output terminal.
49	P133	I/O	P133 signal input/output terminal.
50	P132	I/O	P132 signal input/output terminal.
51	P131	I/O	P131 signal input/output terminal.
52	P130	I/O	P130 signal input/output terminal.
53	P143	I/O	P143 signal input/output terminal.
54	P142	I/O	P142 signal input/output terminal.
55	P141	I/O	P141 signal input/output terminal.
56	P140	I/O	P140 signal input/output terminal.
57	VPP	–	Power supply terminal.
58	VDD	–	Power supply terminal.
59	P33/MD3	O	P33/MD3 signal output terminal.
60	P32/MD2	O	P32/MD2 signal output terminal.
61	P31/MD1	O	P31/MD1 signal output terminal.
62	P30/MD0	O	P30/MD0 signal output terminal.
63	P43	O	P43 signal output terminal.
64	P42	O	P42 signal output terminal.

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